

1200V, 10A 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

KE12DJ10 is a high performance 1200V, 10A 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.

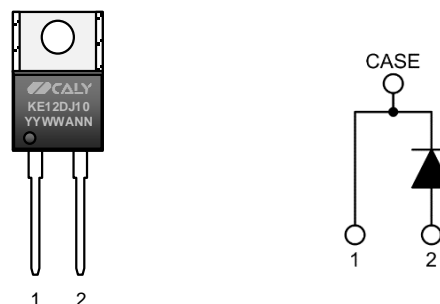
APPLICATIONS

- ▲ Rectification, Voltage Blocking, Boost and Free Wheeling
- ▲ Switching Mode Power Supplies (SMPS)
- ▲ Battery chargers (EV, OBC, computers)
- ▲ 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	10A
Q_C	102nC

DIE OUTLINE



QUICK ORDERING INFORMATION

Part Number	Package	Marking
KE12DJ10B	Bare die	
KE12DJ10W	Wafer	
KE12DJ10T20	TO-220AC (2L)	KE12DJ10
KE12DJ10T52	TO-252-2L (DPAK)	KE12DJ10

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	23 10	A	$T_C=125^\circ\text{C}$, $R_{\theta JC} \leq 0.7^\circ\text{C/W}$ $T_C=162^\circ\text{C}$, $R_{\theta JC} \leq 0.7^\circ\text{C/W}$
Repetitive Peak Forward Surge Current	I_{FRM}	87	A	$T_C=25^\circ\text{C}$, $t_p=10\text{ms}$ half sine wave
Non-repetitive Peak Forward Surge Current	I_{FSM}	260	A	$T_C=25^\circ\text{C}$, $t_p=10\text{ms}$, pulse
Power Dissipation				
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 1.87	1.65 2.2	V	$T_J=25^{\circ}\text{C}$ $T_J=175^{\circ}\text{C}$	$I_F=10\text{A}$
Reverse Current	I_R		3 55	160	μA	$T_J=25^{\circ}\text{C}$ $T_J=175^{\circ}\text{C}$	$V_R=1200\text{V}$
Total Capacitive Charge	Q_C	-	102	-	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		1200 118 88		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}		0.6	0.7	$^{\circ}\text{C}/\text{W}$	

TYPICAL PERFORMANCE

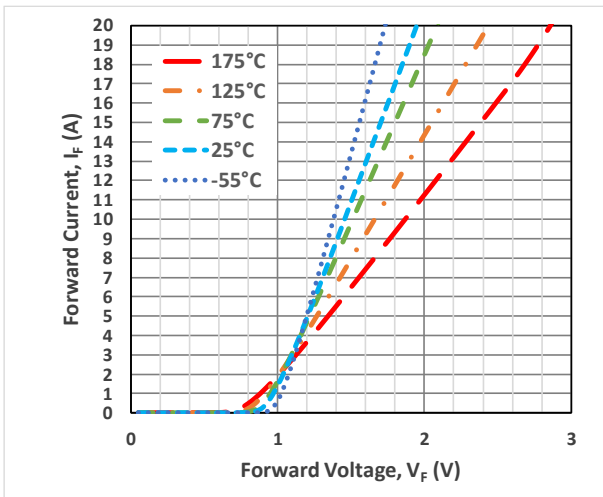


Fig 1. Typical Forward I-V characteristics vs T_J .

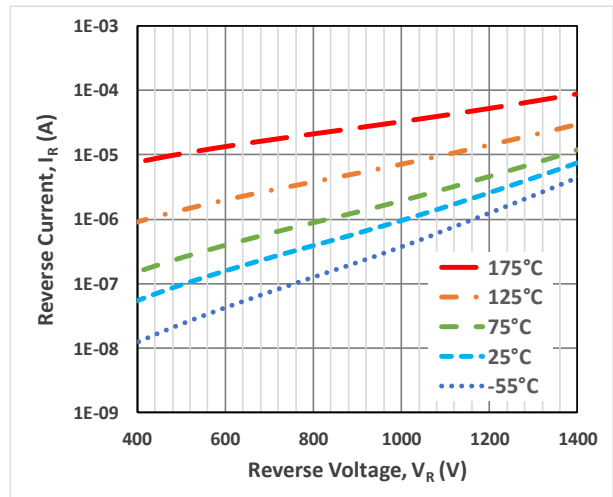


Fig 2. Typical Reverse I-V characteristics vs T_J .

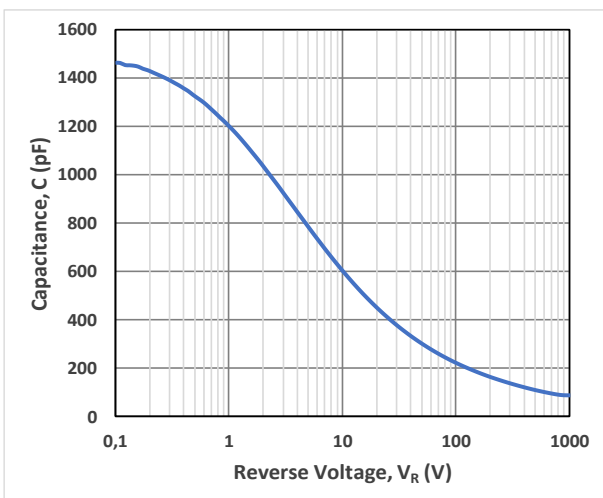


Fig 3. Diode Capacitance C(pF) versus reverse voltage.

DETAILED ORDERING INFORMATION

K ↓ Source K = CALY Technologies	E ↓ Temperature range: E = -55°C to +175°C	12 ↓ Rated Voltage: 12 = 1200V	DJ ↓ Device / Type DJ = Diode / JBS (MPS)	10 ↓ Rated Current: 10 = 10A	T20 ↓ Package: T20 = TO-220-2L
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Part Number	Temperature Range	Package	Pin Count	Marking
KE12DJ10B	-55°C to +175°C	Bare die		
KE12DJ10W	-55°C to +175°C	Wafer		
KE12DJ10T20	-55°C to +175°C	TO-220AC (2L)	2	KE12DJ10
KE12DJ10T52	-55°C to +175°C	TO-252-2L (DPAK)	2	KE12DJ10

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

PACKAGE OUTLINES

TO-220AC-2LD

Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4,32	4,57	0,170	0,180
A1	2,59	2,74	0,102	0,108
A2	1,14	1,40	0,045	0,055
b	0,87	1,00	0,034	0,039
b1	1,23	1,36	0,048	0,054
c	0,36	0,40	0,014	0,016
D	14,71	15,31	0,579	0,603
D1	8,51	8,76	0,335	0,345
D2	12,34	12,45	0,486	0,490
E	10,13	10,24	0,399	0,403
E1	7,57	7,68	0,298	0,302
E2		0,76	0,000	0,030
E3	6,45	6,56	0,254	0,258
e	2.54 BSC		0.100 BSC	
e1	5,03	5,13	0,198	0,202
H1	6,20	6,55	0,244	0,258
L	13,72	14,73	0,540	0,580
L1	3,10	3,85	0,122	0,152
ΦP	3,71	0,37	0,146	0,015
S	2,54	0,31	0,100	0,012

Unique Lot Assembly Code

YY	Last two digits of assembly year (e.g. 16 = 2016).
WW	Assembly week (01 to 52).
M	Assembly location code.
NN	Assembly lot code (01 to 99).

REVISION HISTORY

Revision	Date	Description
1A	2019-07-24	First release

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