

650V, 20A COMMON CATHODE SILICON CARBIDE SiC SCHOTTKY DIODE

FEATURES

- ▲ High Surge Current Capability SiC Schottky (MPS)
- ▲ 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

KE06DJ20D is a high performance 650V, Dual 10A Common Cathode Silicon Carbide (SiC) Schottky with enhanced surge current capabilities (MPS), 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.

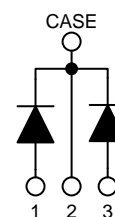
APPLICATIONS

- ▲ 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}	650V
I_F	10 / 20A
Q_C	40 / 80nC

DIE OUTLINE



QUICK ORDERING INFORMATION

Part Number	Package	Marking
KE06DJ20DT47	TO-247-3L	KE06DJ20D

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	650	V	
Repetitive Peak Reverse Voltage	V_{RRM}	650	V	$T_J=25^\circ\text{C}$
Surge Peak Reverse Voltage	V_{RSM}	650	V	
Continuous Forward Current	I_F	16/32 10/20	A	$T_C=125^\circ\text{C}$ $T_C=152^\circ\text{C}$
Repetitive Peak Forward Surge Current	I_{FRM}	42*	A	$T_C=25^\circ\text{C}$, $t_p=10\text{ms}$ half sinewave
Non-repetitive Peak Forward Surge Current	I_{FSM}	80*	A	$T_C=25^\circ\text{C}$, $t_p=10\text{ms}$, pulse
Power Dissipation	P_{Tot}	115 / 230	W	$T_C=25^\circ\text{C}$
Operating Temperature Range	T_J	-55 to +175	$^\circ\text{C}$	
Storage Temperature Range	T_{STG}	-55 to +175	$^\circ\text{C}$	

* Per leg.

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		1.5 1.8	1.65 2.3	V	$T_J=25^{\circ}\text{C}$ $T_J=175^{\circ}\text{C}$	$I_F=10\text{A}^*$
Reverse Current*	I_R		1 5	20 100	μA	$T_J=25^{\circ}\text{C}$ $T_J=175^{\circ}\text{C}$	$V_R=650\text{V}$
Total Capacitive Charge	Q_C	-	40/80	-	nC	$V_R=600\text{V}$, $I_F=10\text{A}$ $di/dt=200\text{A}/\mu\text{s}$	$T_J=25^{\circ}\text{C}$
Total Capacitance*	C		440 57 46		pF	$V_R=1\text{V}$ $V_R=200\text{V}$ $V_R=400\text{V}$	$f=1\text{MHz}$, $T_J=25^{\circ}\text{C}$

* Per leg

THERMAL CHARACTERISTICS

Parameter	Symbol	Values		Unit	Note/Test Condition
		Typ	Max		
Junction-case Thermal Resistance	$R_{\text{TH-JC}}$	1.1 / 0.55	1.3 / 0.65	$^{\circ}\text{C}/\text{W}$	

TYPICAL PERFORMANCE (Per Leg)

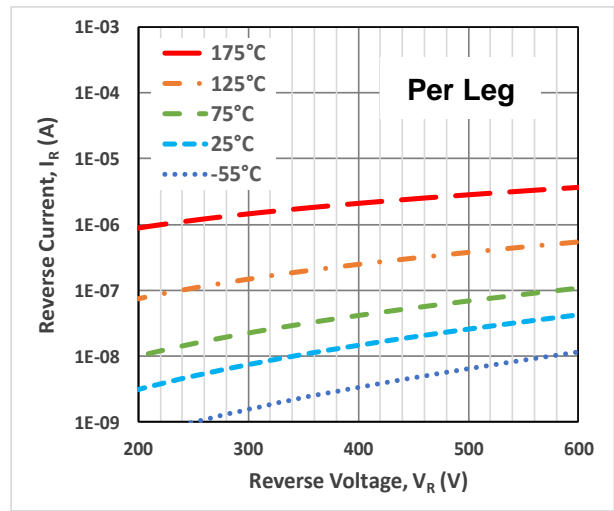
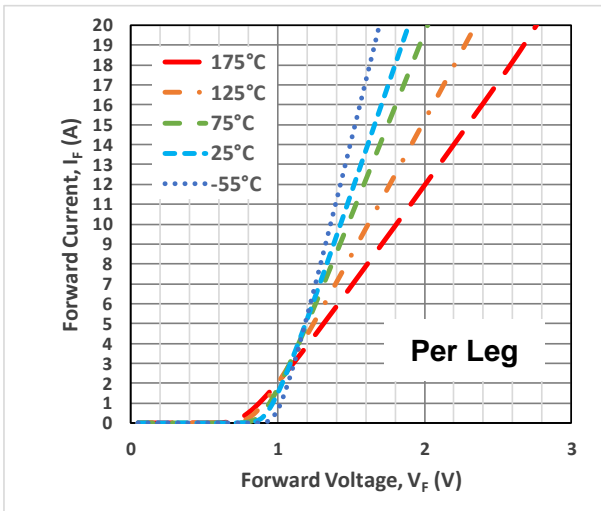


Fig 1. Typical Forward I-V characteristics vs T_J .

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

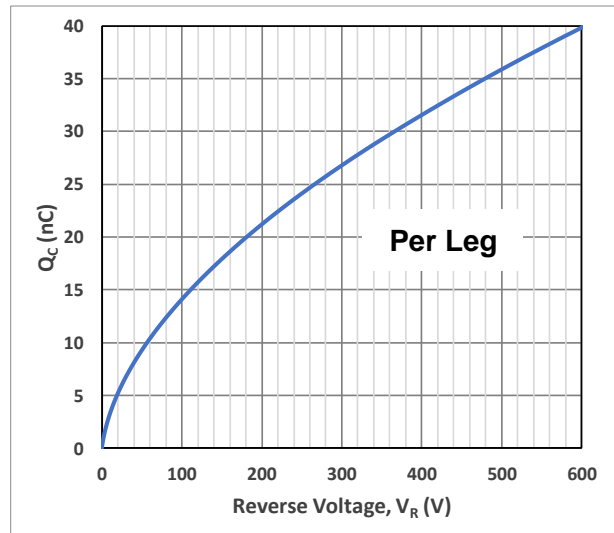
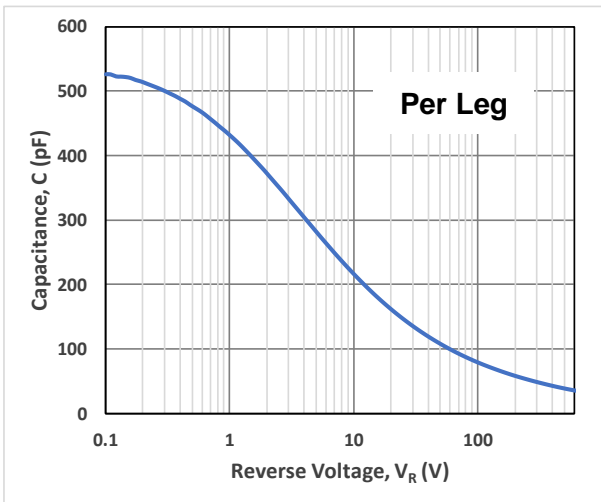


Fig 3. Diode Capacitance C(pF) versus reverse voltage.

Fig 4. Typical capacitive charge (nC) versus reverse voltage.

DETAILED ORDERING INFORMATION

K ↓ Source K = CALY Technologies	E ↓ Temperature range: E = -55°C to +175°C	06 ↓ Rated Voltage: 06 = 650V	DJ ↓ Device / Type DJC = Diode / JBS (MPS)	20D ↓ Rated Current: 20D = Dual 10A (20A)	T47 ↓ Package: T47 = TO-247-3L
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Part Number	Temperature Range	Package	Pin Count	Marking
KE06DJ20DT47	-55°C to +175°C	TO-247-3L	3	KE06DJ20D

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

PACKAGE OUTLINES
TO247-3

Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.83	5.21	0.190	0.205
A1	2.29	2.54	0.090	0.100
A2	1.91	2.16	0.075	0.085
b	1.07	1.32	0.042	0.052
b1	1.88	2.13	0.074	0.084
b2	2.92	3.20	0.115	0.126
c	0.51	0.66	0.020	0.026
D	20.80	20.90	0.819	0.823
D1	16.56	17.83	0.652	0.702
D2	0.51	1.35	0.020	0.053
E	15.49	16.26	0.610	0.640
e	5.44 BSC		0.214 BSC	
E1	13.46	14.02	0.530	0.552
E2	4.27	4.52	0.168	0.178
E3	1.40	1.65	0.055	0.065
L	19.30	19.81	0.760	0.780
L1	4.14	4.39	0.163	0.173
Φ P	3.51	3.56	0.138	0.140
Φ P1	7.06	7.32	0.278	0.288
Q	5.46	5.64	0.215	0.225
S	6.15 BSC		0.242 BSC	

M3 Screw: 1Nm (8.8lbf-in)

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	2019-09-30	First release

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