

碳化硅肖特基二极管

Silicon Carbide Schottky Diode

KS10065-A

V_{RRM}	=	650 V
$I_F (T_C=161^{\circ}\text{C})$	=	10 A
Q_C	=	33 nC

特点 / Features

- 肖特基整流器 / 650-Volt Schottky Rectifier
- 零反向恢复电流 / Zero Reverse Recovery Current
- 零正向恢复电压 / Zero Forward Recovery Voltage
- 高工作频率 / High-Frequency Operation
- 不受温度影响的开关特性 / Temperature-Independent Switching Behavior
- 高速开关 / Extremely Fast Switching
- V_F 正温度特性 / Positive Temperature Coefficient on V_F

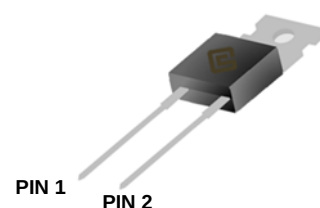
优势 / Benefits

- 单极器件 / Replace Bipolar with Unipolar Rectifiers
- 零开关损耗 / Essentially No Switching Losses
- 高效率 / Higher Efficiency
- 减小散热器 / Reduction of Heat Sink Requirements
- 易于并联使用 / Ease of Paralleling

应用领域 / Applications

- 开关电源 / Switch Mode Power Supplies (SMPS)
- 功率因数校正 / Power Factor Correction
- 电机驱动 / Motor Drives

封装 / Package



TO-220-2L



Part Number	Package	Marking
KS10065-A	TO-220-2L	KS10065A

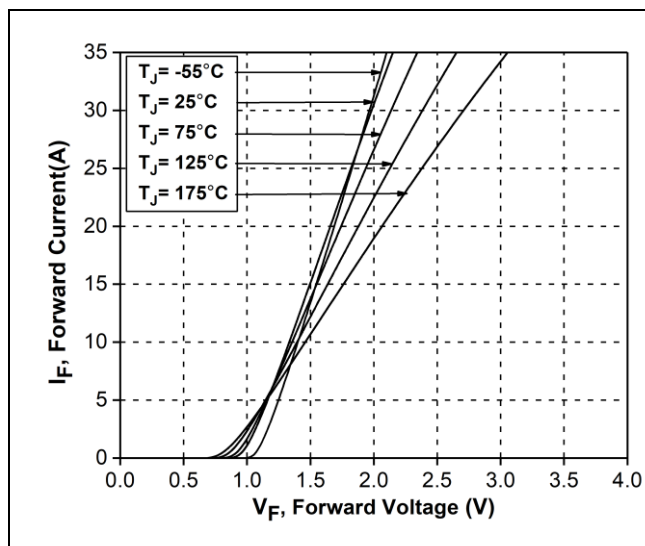
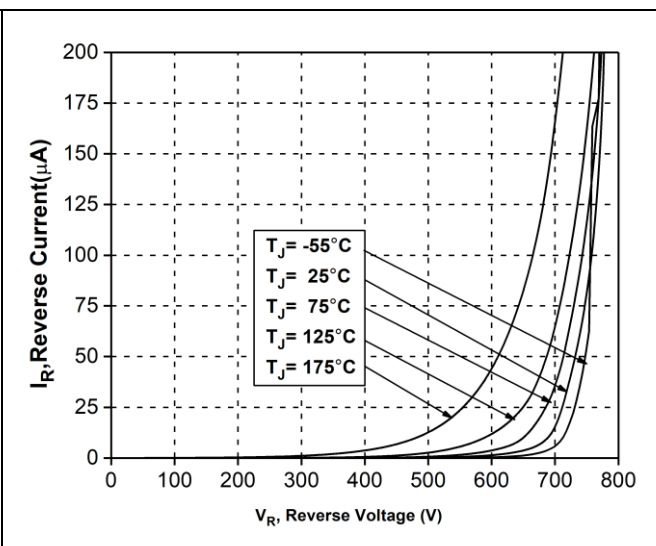
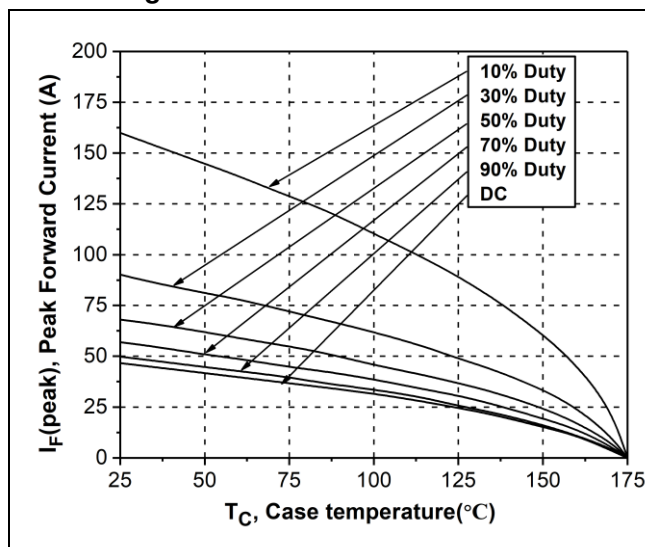
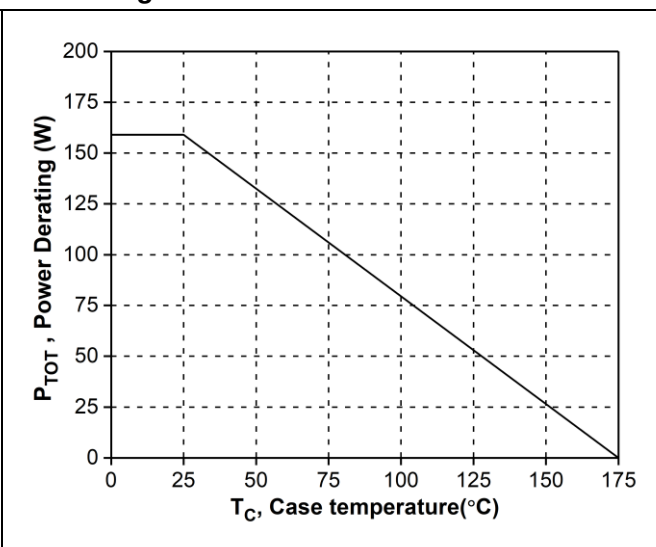
最大额定值 / Maximum Rated Values ($T_C=25^{\circ}\text{C}$ unless otherwise specified)

符号 Symbol	参数 Parameter	值 Value	单位 Unit	测试条件 Test Conditions	备注 Note
V_{RRM}	反向重复峰值电压 Repetitive peak reverse voltage	650	V		
V_R	直流反向阻断电压 DC Peak Reverse Voltage	650	V		
I_F	正向电流 Continuous Forward Current	46 21 10	A	$T_C=25^{\circ}\text{C}$ $T_C=135^{\circ}\text{C}$ $T_C=161^{\circ}\text{C}$	Figure 3
I_{FRM}	正向重复峰值电流 Repetitive Peak Forward Surge Current	80 63	A	$T_C=25^{\circ}\text{C}$, $t_P=10\text{ms}$, Half Sine Pulse $T_C=110^{\circ}\text{C}$, $t_P=10\text{ms}$, Half Sine Pulse	
I_{FSM}	正向浪涌电流 Non-Repetitive Forward Surge Current	105 93	A	$T_C=25^{\circ}\text{C}$, $t_P=10\text{ms}$, Half Sine Pulse $T_C=110^{\circ}\text{C}$, $t_P=10\text{ms}$, Half Sine Pulse	Figure 9
$I_{F,MAX}$	非重复正向峰值电流 Non-Repetitive Peak Forward Current	783 652	A	$T_C=25^{\circ}\text{C}$, $t_P=10\mu\text{s}$, Square Wave Pulse $T_C=110^{\circ}\text{C}$, $t_P=10\mu\text{s}$, Square Wave Pulse	Figure 9
P_{tot}	耗散功率 Power Dissipation	159 69	W	$T_C=25^{\circ}\text{C}$ $T_C=110^{\circ}\text{C}$	Figure 4
T_J	工作结温 Operating Temperature	-55 to +175	$^{\circ}\text{C}$		
T_{stg}	储存温度 Storage Temperature	-55 to +175	$^{\circ}\text{C}$		

电气参数 / Electrical Characteristics ($T_J=25^{\circ}\text{C}$ unless otherwise specified)

符号 Symbol	参数 Parameter	值 / Value			单位 Unit	测试条件 Test Conditions	备注 Note
		Min.	Typ.	Max.			
V_{DC}	击穿电压 DC blocking voltage	650			V	$I_R=200\mu\text{A}$	
V_F	正向电压 Forward Voltage		1.33 1.5	1.7 2.0	V	$I_F=10\text{A}$, $T_J=25^{\circ}\text{C}$ $I_F=10\text{A}$, $T_J=175^{\circ}\text{C}$	Figure 1
I_R	反向电流 Reverse Current		1 80	20 160	μA	$V_R=650\text{V}$, $T_J=25^{\circ}\text{C}$ $V_R=650\text{V}$, $T_J=175^{\circ}\text{C}$	Figure 2
Q_C	容性电荷 Total Capacitive Charge		33		nC	$V_R=400\text{V}$, $T_J=25^{\circ}\text{C}$	Figure 5
C	总电容 Total Capacitance		655 61 54		pF	$V_R=0\text{V}$, $T_J=25^{\circ}\text{C}$, $f=1\text{MHz}$ $V_R=200\text{V}$, $T_J=25^{\circ}\text{C}$, $f=1\text{MHz}$ $V_R=400\text{V}$, $T_J=25^{\circ}\text{C}$, $f=1\text{MHz}$	Figure 6
E_C	电容存储能量 Capacitance Stored Energy		4.8		μJ	$V_R=400\text{V}$	Figure 7

符号 Symbol	参数 Parameter	值 Value	单位 Unit	备注 Note
$R_{\theta JC}$	结壳热阻 Thermal Resistance(Junction to Case)	0.94	$^{\circ}\text{C/W}$	Figure 8

特性曲线 / Typical Performance

Figure 1. Forward Characteristics

Figure 2. Reverse Characteristics

Figure 3. Current Derating

Figure 4. Power Derating

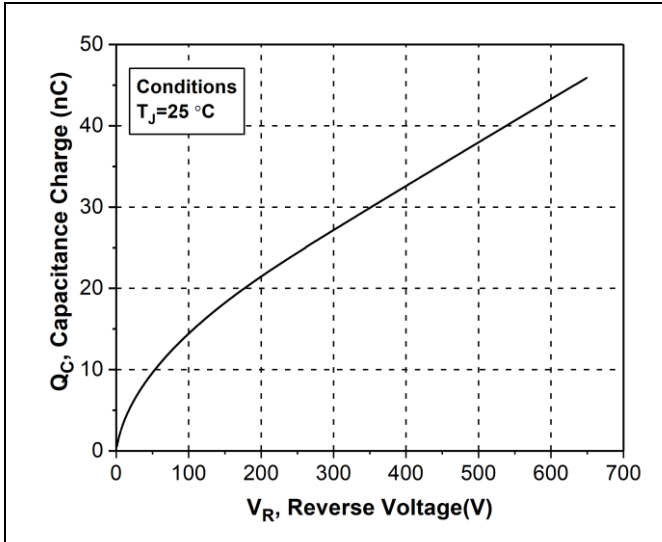


Figure 5. Capacitance Charge Vs. Reverse Voltage

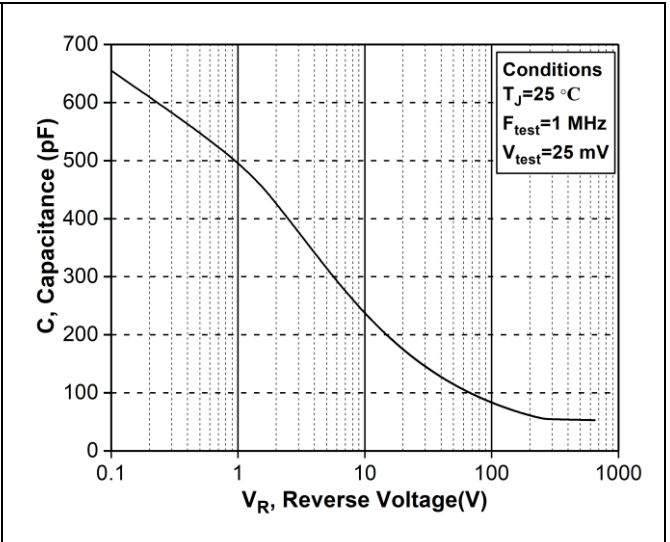


Figure 6. Capacitance Vs. Reverse Voltage

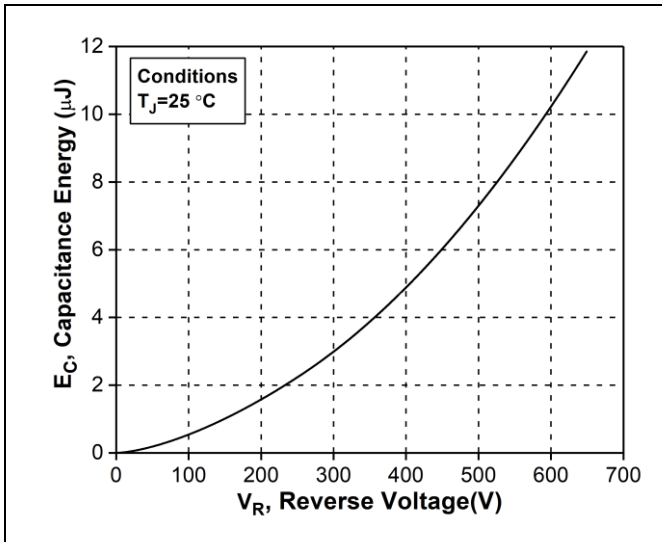


Figure 7. Capacitance Stored Energy

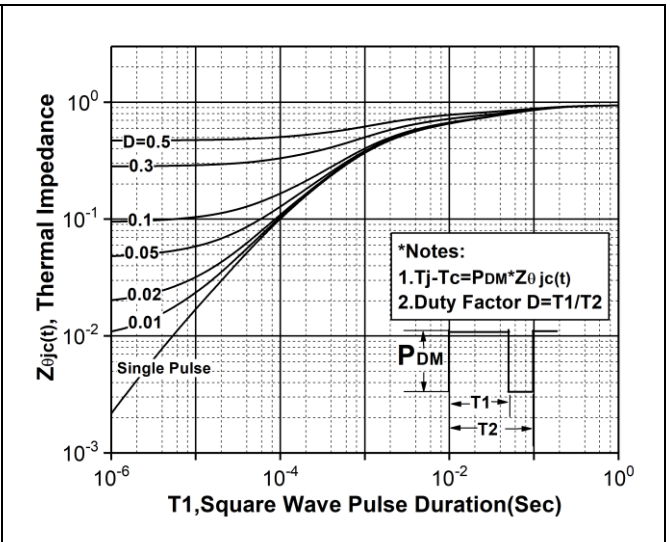


Figure 8. Transient Thermal Response Curve(Junction-to-Case)

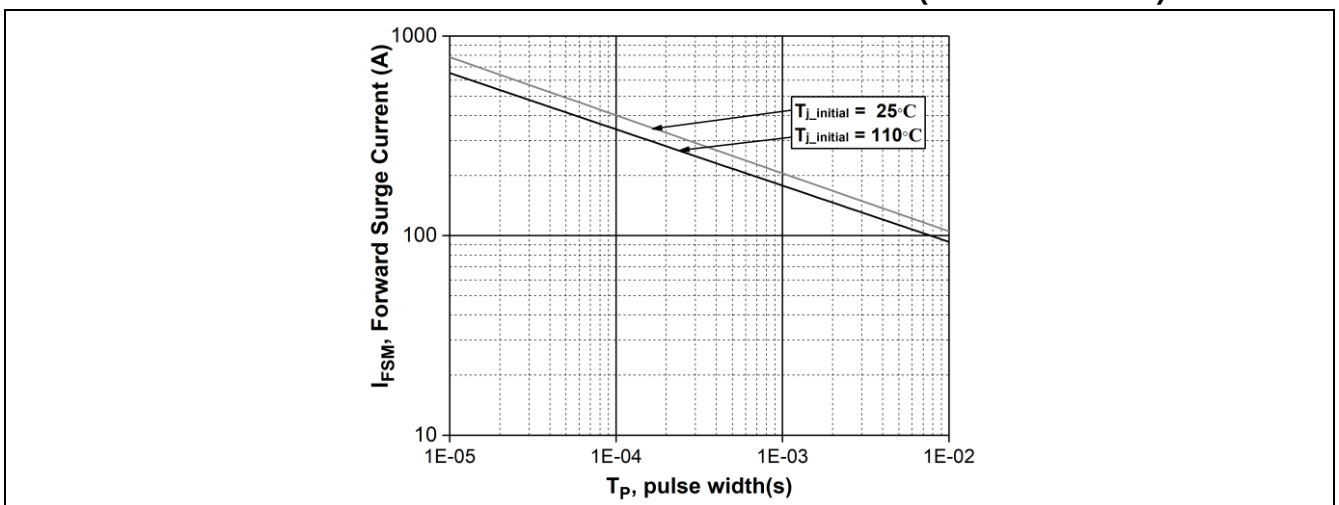
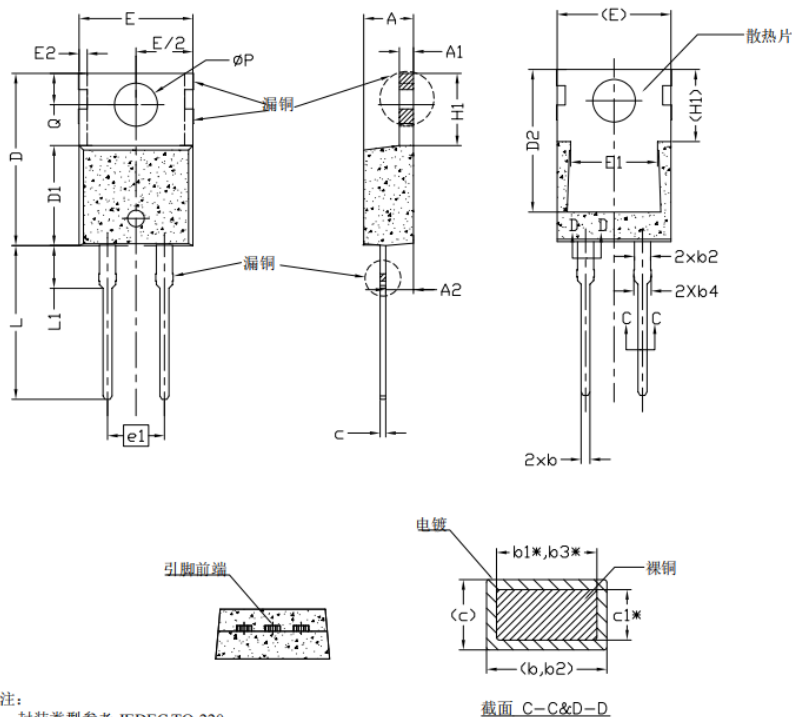


Figure 9. Non-repetitive peak forward surge current versus pulse duration (sinusoidal waveform)

Package TO-220-2L

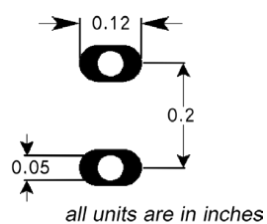


标号	尺寸			备注
	最小值	典型值	最大值	
A	4.24	4.44	4.64	
A1	1.17	1.27	1.37	
A2	2.30	2.48	2.70	
b	0.70	0.80	0.90	
b1*	0.70	—	0.85	4
b2	1.25	1.45	1.65	
b3*	1.20	—	1.65	4
b4	1.25	1.55	1.75	
c	0.40	0.50	0.60	
c1*	0.40	—	0.55	4
D	14.87	15.37	15.87	3
D1	8.82	8.92	9.02	
D2	12.43	12.73	12.83	
E	9.96	10.16	10.36	3
E1	6.86	7.77	8.89	
E2	—	—	0.76	
e1	5.08BSC.			
H1	6.30	6.45	6.60	
L	13.47	13.72	13.97	
L1	3.60	3.80	4.00	
øP	3.75	3.84	3.93	
Q	2.60	2.80	3.00	

备注:

1. 封装类型参考 JEDEC TO-220;
2. 所有尺寸单位均为 mm;
3. 尺寸D&E不包含密封胶溢料, 密封胶毛边不能超过0.127mm, 尺寸测量都是在密封胶的最外层测量;
4. 尺寸b1*&b3*&c1*仅适用于裸铜。

参考焊盘图 / Recommended Solder Pad Layout



TO-220-2L

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