TS120PLS44C1

SiC MPS 芯片 SiC MPS Chip

关键参数 Key Parameters

V_R		1200	V
V_F	Typ.	1.40	V
I_F	Max.	50	A
Die Size		4.51×4.51	mm^2

电路结构 Circuit Configuration

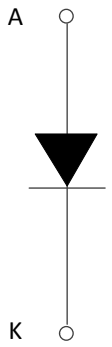


图 1. 电路结构

Fig. 1 Circuit configuration

特点 Features

- 零反向恢复电流 Zero Reverse Recovery Current
- 温度依赖性低 Reduced Temperature Dependence
- 高效率 Higher Efficiency
- 简化散热系统 Reduced Cooling Requirements

最大额定值 Maximum Ratings

符号 Symbol	参数名称 Parameter	测试条件 Test Conditions	数值 Value	单位 Unit
V_{RRM}	重复峰值反向电压 Repetitive peak reverse voltage		1200	V
I_F	持续正向电流，由 $T_{vj\,max}$ 限制 Continuous forward current, limited by $T_{vj\,max}$		50	A
I_{FRM}	最大重复正向电流，由 $T_{vj\,max}$ 限制 Maximum repetitive forward current, limited by $T_{vj\,max}$	T_C = 25 °C， t_P = 10ms	200	A
		T_C = 100 °C， t_P = 10ms	150	A
I_{FSM}	不可重复正向浪涌电流 Non-Repetitive peak forward surge current	T_C = 25 °C，t_P = 10ms，正弦半波 T_C = 25°C，t_P = 10ms, Half Sine Pulse	578	A
		T_C = 150 °C，t_P = 10ms，正弦半波 T_C = 150 °C，t_P = 10ms, Half Sine Pulse	500	A
I^2t	I^2t 值 I^2t value	T_C = 25 °C，t_P = 10ms，正弦半波 T_C = 25 °C，t_P = 10ms, Half Sine Pulse	1069	A^2s
		T_C = 150 °C，t_P = 10ms，正弦半波 T_C = 150 °C，t_P = 10ms, Half Sine Pulse	800	A^2s
$T_{vj\,max}$	最大允许结温 Max. Junction temperature		-55...+175	°C
$T_{vj(op)}$	工作结温 Operation junction temperature		-55...+150	°C
T_{Proc}	最大加工温度 Maximum processing temperature	最长持续时间 10min 10min, maximum	325	°C

电特性值 Electrical Characteristics

除非特别声明，否则 T_{vj}= 25 °C　　T_{vj}= 25 °C unless otherwise stated

符号 Symbol	参数名称 Parameter	条件 Test Conditions	最小值 Min.	典型值 Typ.	最大值 Max.	单位 Unit
V_F	正向电压 Forward voltage drop	I_F =50A		1.40		V
		I_F = 50A, T_{vj} = 175°C		1.75		V
I_R	反向漏电流 Reverse Current	V_R= 1200V			1	μA
		V_R= 1200V, T_{vj} = 175°C			5	μA
Q_C	总电容电荷 Total Capacitive Charge	V_R = 800V		244		nC
C	总电容 Total Capacitance	V_R = 0V, f = 100kHz		2646		pF
		V_R =400V, f = 100kHz		226		
		V_R = 800V, f = 100kHz		189		
E_C	电容存储能量 Capacitance Stored Energy	V_R = 800V		125		μJ

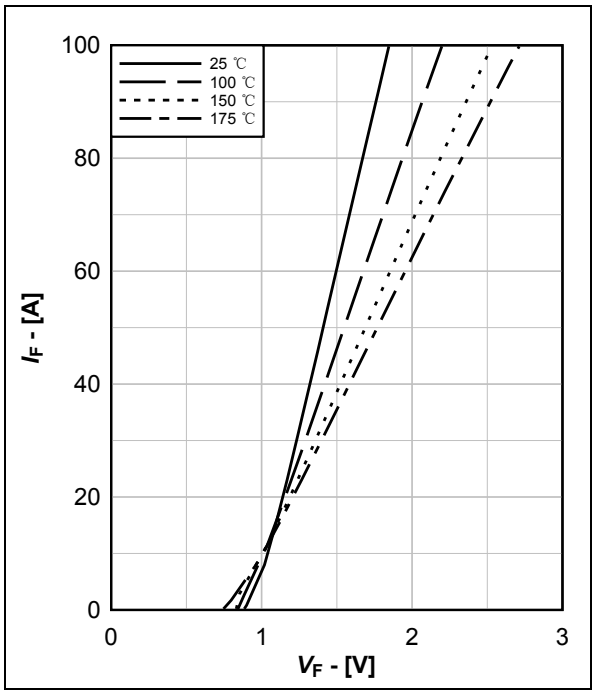


图 2. 典型正向特性曲线, I_F=f(V_F)

Fig.2 Typical forward characteristics per leg, I_F=f(V_F)

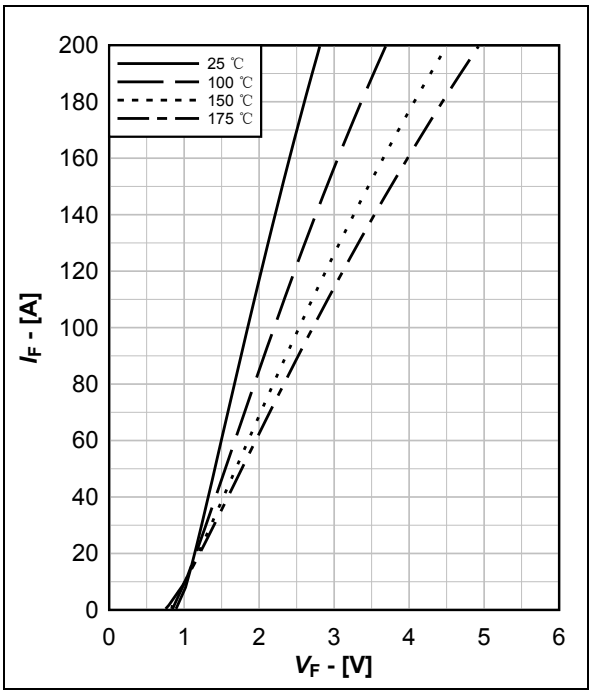


图 3. 典型正向特性曲线, I_F= f (V_F)

Fig.3 Typical forward characteristics per leg, I_F=f(V_F)

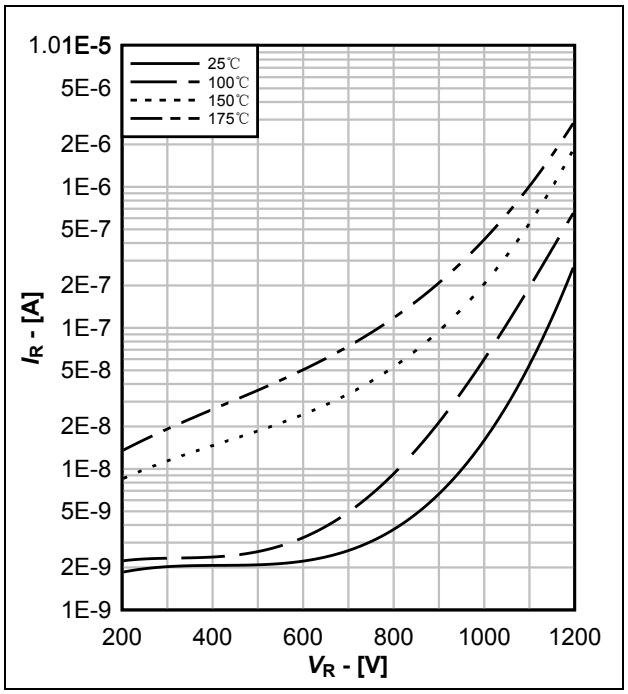


图 4. 典型反向特性曲线, I_R= f (V_R)

Fig.4 Typical IGBT output characteristics, I_R= f (V_R)

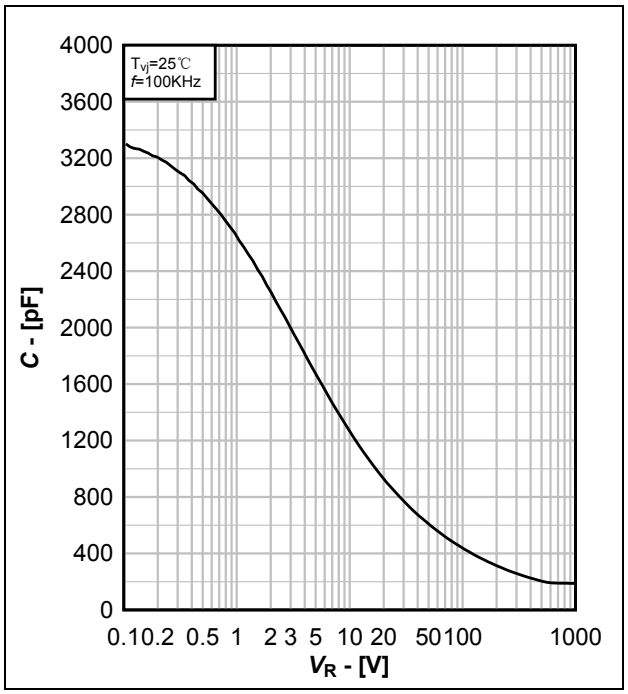


图 5. 典型电容与反向电压曲线, C=f(V_R)

Fig.5 Typical capacitance per leg as function of reverse voltage, C=f(V_R)

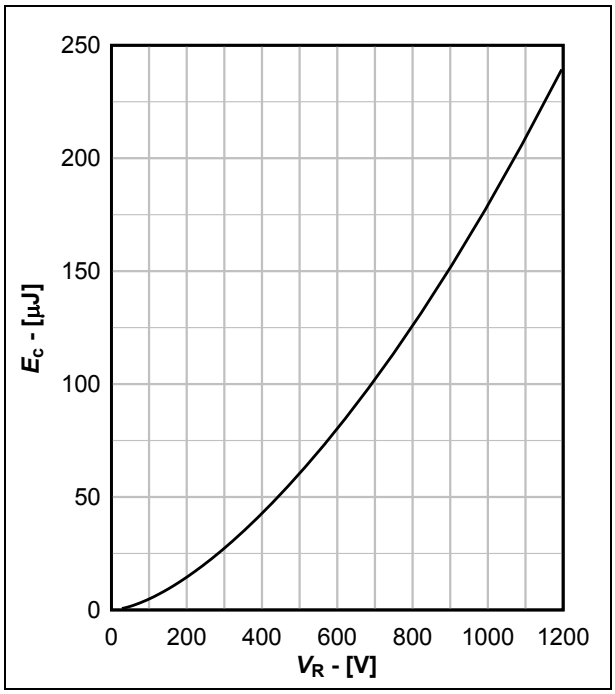


图 6. 典型电容能量与反向电压曲线, E_C=f(V_R)

Fig.6 Typical capacitively stored energy asfunction of reverse voltage, per leg, E_C=f(V_R)

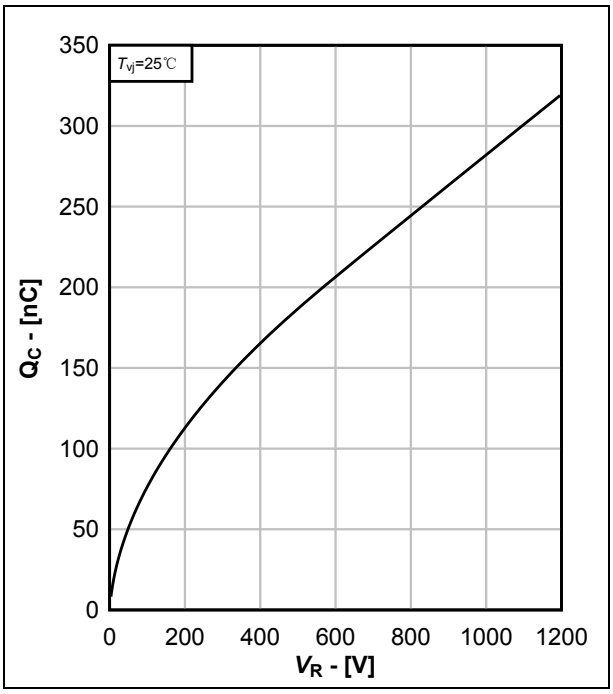
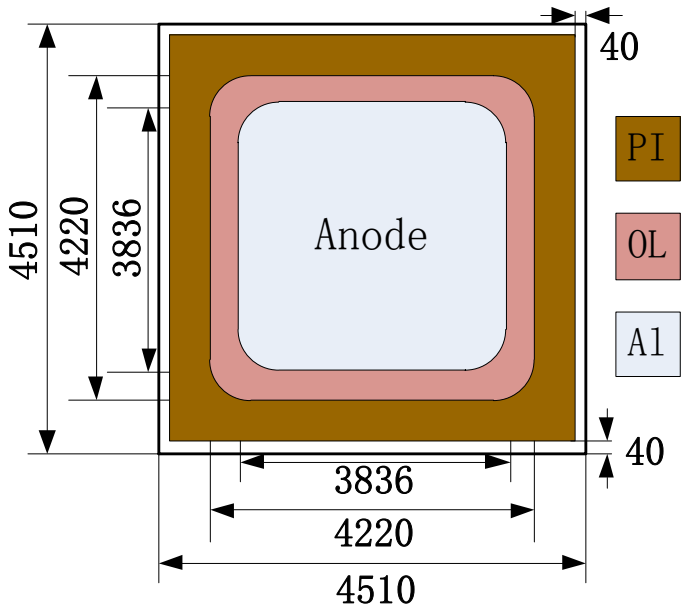


图 7. 总电容电荷曲线， QC = f (V_R)

Fig.7 Total Capacitance Charge vs. Reverse Voltage, Q_C = f (V_R)

工艺参数值 **Mechanical Parameters**

芯片尺寸 Chip size	4.51×4.51	mm^2
阳极区尺寸 Anode pad size	3.836×3.836	mm^2
总面积 Area total	20.34	mm^2
厚度 Thickness	150	μm
晶圆尺寸 Wafer size	150	mm
每片晶圆上最大芯片数 Max. possible chips per wafer	692	
阳极金属 Anode metal	Ti(0.2μm)-Al(4μm)	
阴极金属 Cathode metal	Ni(200nm)- Ti(50nm)- Ni(500nm)- Ag(500nm)	
正面钝化 Passivation frontside	Polyimide	
建议存储环境 Recommended storage environment	存储在原始容器中，23°C 干燥氮气柜小于 6 个月 Store in original container, in dry nitrogen, <6 months at an ambient temperature of 23°C	



单位：微米 Unit: μm

图 8. 芯片外观尺寸

Fig. 8 Chip drawing

株洲中车时代半导体有限公司

ZHUZHOU CRRC TIMES SEMICONDUCTOR CO., LTD

地 址	Address	湖南省株洲市石峰区田心工业园 Tianxin Industrial Park, Shifeng District, ZhuZhou City, Hunan Province, China
邮 编	Zipcode	412001
电 话	Telephone	+86 (0)731-28498268, 28498238, 28493472
传 真	Fax	+86 (0)731-28498851, 28498494
电子邮箱	Email	ctsc@csrzic.com
网 址	Web Site	http://ctsc.csrzic.com

使用条件和条款

（1）数据手册中的产品信息是专门为技术人员提供的。由于产品应用的多样性，本文件所包含的信息只能作为一般性指南，无法保证其在某些特殊应用中的适用性，建议用户在使用前评估产品的适用性。如果需要额外的产品信息和帮助，请联系我公司的销售或技术支持。

（2）本产品数据手册中提供的一部分产品数据是产品的典型值，实际出厂测试的产品数据可能与典型值略有偏离，但我公司保证这些偏离不会影响产品的正常使用。如果产品信息发生变更，我公司会及时修订产品数据手册，请随时关注我公司网站发布的产品手册信息。

（3）如果对本产品有特殊要求，或用于特殊行业（如航空航天、医疗、生命维持等），强烈建议用户与我公司联合进行应用风险和产品质量评估，建立统一的质量协议。

（4）产品使用过程中，如有超出产品数据手册中所定义的产品极限温度、电压、电流或安全工作区范围的情况，我公司无法保证产品的应用可靠性。

（5）产品数据手册首页的右上角，会显示产品的状态。如果它尚未完全批准，会标示**初版（preliminary）**，该标示意味着该产品已完成设计，量产的产品参数正在确定中，数据手册中的产品信息目前是可以参考的，但将来某些细节可能会发生变化。如果产品数据手册首页的右上角没有标注，则表示该产品已可以批量生产。

Terms and conditions of usage

(1) The product information in this datasheet are intended for use by technical personnel. Due to the diversity of product applications, the information contained in this document can only be used as a general guide, the application applicability cannot be guaranteed in some special applications. It is recommended that users do the assessment of the application applicability before applied. If users need additional product information and help, please contact our sales or technical support.

(2) Some product data in the datasheet of this product are the typical values, the actual factory testing data may deviate slightly from typical values, but our company guarantees that these deviations will not affect the normal use of the product. If the product information changes, our company will promptly amend the datasheet, please keeps your attention to product information changing in our company website.

(3) If there are special requirements for the product, or apply it in special industries (such as aerospace, medical, life support, etc.), we strongly recommend that to perform joint application risk and quality assessments, get the quality agreements.

(4) During the application, if the working conditions are beyond the limitation of temperature, voltage, current or safe operating area of the product defined in the product datasheet, our company cannot guarantee the reliability of the product.

(5) We annotate datasheet in the top right hand corner of the front page, to indicate product status. The annotation“Preliminary” indicates the product design is complete and final characterization for volume production is in progress，the product information in the datasheet is currently can be referenced, but some details may change in the future. There is no annotation indicates the product is capable to produce in batch quantity.