国星光电
NATIONSTAR

股票代码:002449

第三代半导体

THE THIRD GENERATION
SEMICONDUCTOR

产品与服务宣传资料

THE PUBLICITY MATERIALS FOR
PRODUCTS AND SERVICES

2023-2024

时代国星 光芒有你

Time NATIONSTAR, Shining With You

佛山市国星光电股份有限公司
FOSHAN NATIONSTAR OPTOELECTRONICS CO.,LTD.

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国星二维码

公司简介 Company Introduction

国星光电是广晟集团旗下专业生产LED及LED应用产品的国家级重点高新技术企业，是国内最早生产LED的企业之一，国内第一家以LED为主业首发上市的企业，也是国内最大的LED生产制造企业之一。

五十多年来，国星光电从一家小型的国营工厂成长为LED产业链垂直一体化的高新技术上市公司，公司营业收入位列LED封装企业全球前列。在新的历史征程上，国星光电正向着“百年企业”、“世界级企业”的宏伟目标迈进。

国家“十四五”对半导体集成电路领域有着重要的规划，国星光电在“三代半封测”领域也在大力投入。国星光电“三代半封测”传承的是“LED封测”高可靠性的品质管理体系，致力于打造高可靠性及高品质优势的“三代半功率器件封测企业”。

NATIONSTAR is a high-tech company as the LED producer under the Guangdong Rising Holdings Group Co., Ltd. It is one of the earliest and the largest LED producer in China, and it is also the first LED listed enterprise in China.

In the past 50 years, NATIONSTAR has grown from a small state-owned factory to a high-tech listed company. It has vertical integration of the LED industry chain, and its operating income ranks at the forefront of LED packaging enterprises in the world. In the future, NATIONSTAR will keep moving towards the grand goal of "Centennial company" and "Internationalized company".

Based on The national “14th Five-Year Plan” , the three-generation semiconductor industry in NATIONSTAR develops rapidly, which inherits the high-level management system of LED production with high reliability and high-quality advantages.

计划经济时代的国营工厂
A State Owned Factory in the Planned Economy Era

改革开放时代的代工型企业
An OEM Manufacturer in the Reform and Opening Era

新世纪民营自主创新型企业
An Independent innovation Private Enterprise in the New Century

产业链融合的高科技上市公司
A High-tech Listed Company in the Integration of LED Industry Chain

1969

公司正式成立

NATIONSTAR, was founded.

1976

正式投产LED

LED were put into production.

1981

与日本三洋合作生产LED产品

NATIONSTAR started cooperation with Sanyo(Japan) to produce LED.

1995

荣列“1949－1995中华之最”之林

The company won the title of “The Best in China” issued by the State Council

2000

公司开始自主创新的道路

NATIONSTAR enhanced its focus on innovation and LED technology research.

2002

公司完成转制

NATIONSTAR transformed from a state-owned company to a private enterprise.

2010

公司在深圳证交所挂牌上市

The active development and fruitful achievements made NATIONSTAR succeed in IPO.

2014

广晟集团入资国星光电

GUANGDONG RISING HOLDINGS GROUP CO.,LTD. a big state-owned corporation, invested in NATIONSTAR.

2019

公司荣获国家科技进步一等奖

NATIONSTAR won the first prize of National Science and Technology Progress Award.

2021

公司南庄吉利产业园项目一期封顶

The roof of the project in Nanzhuang Geely Industrial Park has been sealed.

2022

公司入选国务院国资委“科改企业”名单

The company has been selected for the list of "Science and Technology Reform Enterprises" by SASAC

① 佛山禅城基地:国星光电总部
The Production Base of LEDs and LED Lightings Located in Foshan

占地面积:60,050.23平方米
建筑面积:140,552.38平方米
Land Area: 60,050.23m²
Building Area: 140,552.38m²

② 佛山禅城基地:
南庄吉利产业园项目
Foshan Chancheng Base:
Nanzhuang Geely Industrial Park

占地面积:54,141.06平方米
建筑面积:191,308平方米
Land Area: 54,141.06m²
Building Area: 191,308m²

③ 佛山南海基地:国星半导体
The Production Base of LED Chips Located in Foshan

占地面积:31,809.30平方米
建筑面积:63,816.54平方米
Land Area: 31,819.30m²
Building Area: 63,816.54m²

④ 广州科学城基地:风华芯电
Guangzhou Science City Base: Fenghua Semiconductor Technology

占地面积:29,809平方米
建筑面积:38,959.42平方米
Land Area: 29,809m²
Building Area: 38,959.42m²

磨片划片
Wafer Dicing

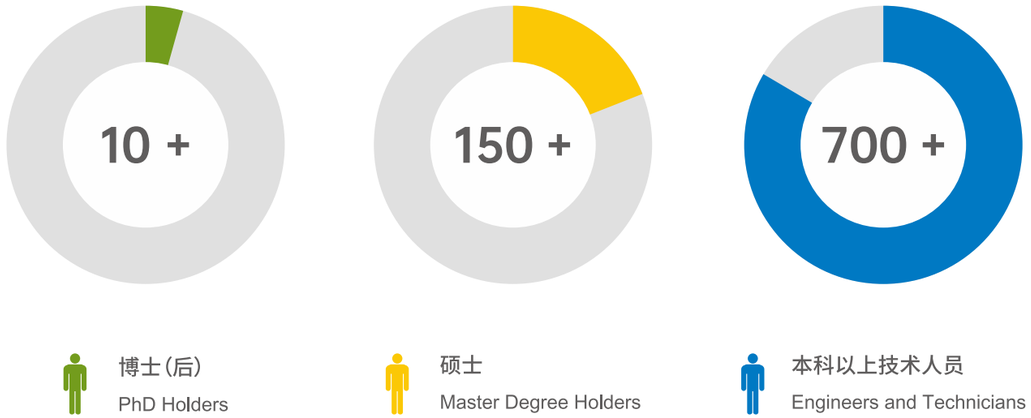
焊线
Wire Bonding

切筋成型
Trim & Form

粘片
Chip Transfer

模封
Mold Sealing

测试、包装
Testing & Packing



博士(后)
PhD Holders

硕士
Master Degree Holders

本科以上技术人员
Engineers and Technicians

- 博士后科研工作站(人力资源和社会保障部批准)
- 国家地方联合工程实验室(国家发展和改革委员会)
- 中国合格评定国家认可委员会(CNAS)实验室
- 粤港澳智能微纳光电技术联合实验室
- 广东省半导体微显示企业重点实验室
- 广东省博士工作站
- 广东省联合培养研究生示范基地
- 广东省健康照明工程技术研究中心
- 广东省光电子工程技术研究开发中心
- 广东省LED外延芯片工程技术研究开发中心
- 广东省企业技术中心
- Micro&Mini LED研究中心
- 广东省佛山国星光电股份有限公司研究院

- Postdoctoral Workstation
- National Engineering Laboratory
- CNAS Laboratory
- Guangdong-Hong Kong-Macao Intelligent Micro-nano Photoelectric Technology Joint Laboratory
- Guangdong Semiconductor Micro Display Enterprise Key Laboratory
- Doctor Workstation in Guangdong Province
- Demonstration Base for Joint Training Graduate Student in Guangdong Province
- Health Lighting Engineering Technology Research Center of Guangdong Province
- Optoelectronic Engineering Technology Research and Development Center of Guangdong Province
- Led Epitaxy Chip Engineering Technology Research and Development Center In Guangdong Province
- Enterprise Technology Center of Guangdong Province
- Micro&mini LED Research Center
- NATIONSTAR Research Institute

国星光电每年以上亿元资金用于科研开发，公司已申请专利破1100项，其中发明专利超500项，境外专利70多项；已授权专利730多项，其中发明专利授权160多项。并与NIMS、丰田合成、GE公司达成专利合作协议。

NATIONSTAR invests over 100 million yuan annually in scientific research and development. The company has applied for over 1100 patents, including nearly 500 invention patents, over 70 overseas patents and more than 730 granted patents (over 160 invention patents) . It has reached patent cooperation agreements with NIMS, Toyota Synthetic, and GE.

▸已申请

破1100项
专利申请
Patent Application

500多项
发明专利
Invention Patents

70多项
境外专利
Overseas Patents

▸已授权

730多项
专利
Granted Patents

160多项
发明专利
Granted Invention Patents

风乘国家“十四五”对半导体集成电路领域的规划，国星光电在“三代半封测”领域也在大力布局。国星光电“三代半封测”传承的是“LED封测”高可靠性的品质管理体系，致力于打造高可靠性及高品质优势的“三代半功率器件封测企业”。未来，在国家“十四五”规划的伟大蓝图下，国星光电定将持续加大第三代半导体的研究开发和技术成果转化，为国家战略安全、为第三代半导体国产化贡献力量。

Based on the national “14th Five-Year Plan” for the field of semiconductor integrated circuits, Nationstar is vigorously deploying in the “the packaging and testing of third generation semiconductors” field.

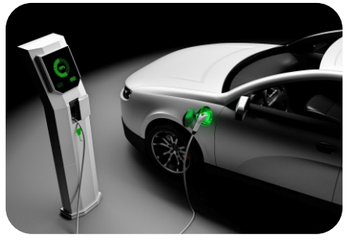
Nationstar inherits the the high level management system of LED production, focusing on creating the power device Packing and testing enterprise of third generation semiconductors " with high reliability and high-quality advantages.

In the future, Nationstar will continue to increase the research and development of third generation semiconductors and transform technical achievements, contributing to national strategic security and the localization.

电力电子方向国星光电侧重于智能电网、高速轨道交通、新能源汽车、消费电子等应用。

NATIONSTAR focus on power electronics applications such as smart grids, high-speed rail transit, new energy vehicles, and consumer electronics.

快充
Fast charging



新能源汽车
New energy vehicles

数据中心
Data center

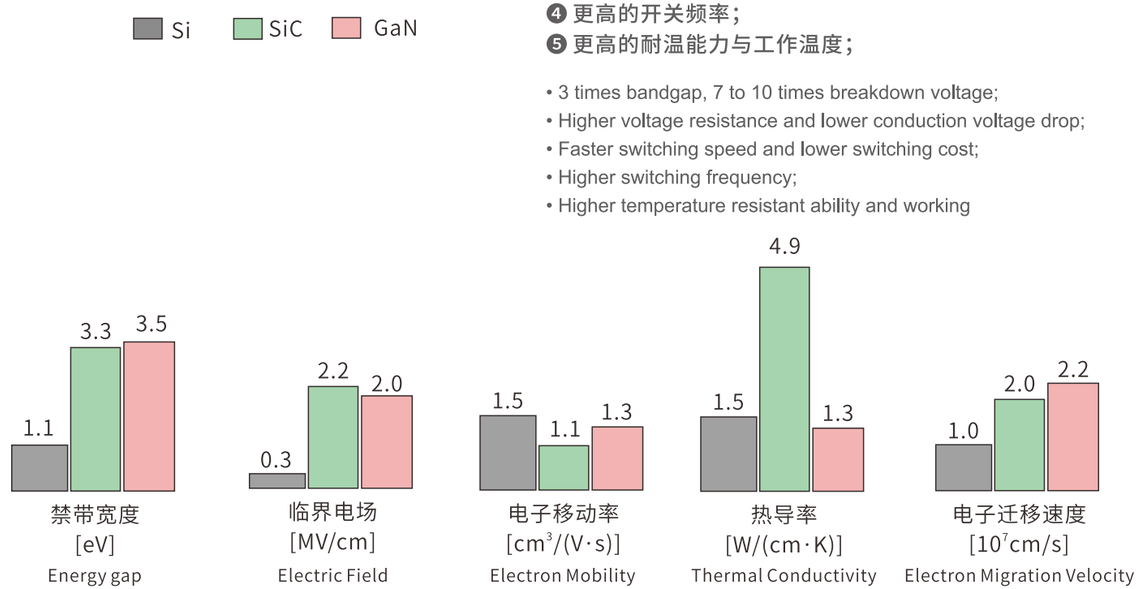
其他消费类（加湿器）
Consumer electronics(humidifier)

* 本页图片素材来源于网络
From Internet

SiC&GaN与Si相比 Advantages of SiC and GaN (comparing to Si)

❶ 禁带宽度是Si的3倍以上，击穿场强为Si的7-10倍；
❷ 更高的耐压能力以及更低的导通压降；
❸ 更快的开关速度和更低的开关损耗；
❹ 更高的开关频率；
❺ 更高的耐温能力与工作温度；

- 3 times bandgap, 7 to 10 times breakdown voltage;
- Higher voltage resistance and lower conduction voltage drop;
- Faster switching speed and lower switching cost;
- Higher switching frequency;
- Higher temperature resistant ability and working



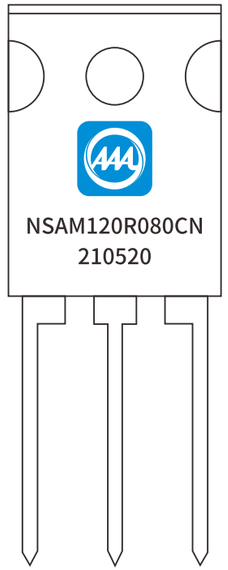
满足更高端应用场景 High power application scenarios

Photovoltaics | Electric Vehicle | High-speed Rail | Transmission Network | Wind Power Generation

* 本页图片素材来源于网络
From Internet

SiC 功率器件 Sic Device	TO-247 TO-220 TO-252 TO-263 DFN	UPS电源、充电桩等工业应用领域 UPS power supply, charging station and other industrial application areas	特性： 小而轻便，反向恢复快、抗浪涌能力强、雪崩耐压高，具备优越的性能与极高的工作效率 Characteristics: • Small size, light weight, fast reverse recovery, strong resistance to surge current, strong resistance to avalanche voltage, superior performance and extremely high efficiency
GaN 功率器件 Gan Device	DFN IC-SOP	快充、智能控制等工业应用领域 Fast charging and intelligent control and other industrial application areas	特性： ① 氮化镓材料具备更高的临界电场、独有的出色导通电阻、更低的电容，使其尤为适用于功率半导体器件，不仅是节能和系统总成本的降低，且工作频率更高，具有极高的功率密度和系统效率 ② 国星光电的GaN-DFN器件可用于快充电路，极大地提升了充电效率 Characteristics: • GaN has a higher critical electric field, unique excellent conduction resistance, and lower capacitance, making it particularly suitable for power semiconductor devices. It not only saves energy and reduces the total system cost, but also operates at higher frequencies, with extremely high power density and system efficiency • GaN-DFN device can be used in the fast charging circuit, greatly improving the charging efficiency
SiC 功率模块 Sic Module	双面模块 单面模块	UPS电源、充电桩等工业应用领域 UPS power supply, Charging station and other industrial applications	特性： ① 具有优越的电性能和热性能，杂散电感低、转换效率高、轻载损耗小 ② 功率密度大，产品体型小，有助于满足系统开发人员对空间的严格要求 Characteristics: • Superior electrical and thermal performance, low stray inductance, high efficiency, and low light load losses • High power density and small product size help meet the strict space requirements of system developers
电源应用方案 Power Supply		墙插、LED驱动电源、电源适配器等 Wall socket, LED driver, power adapter, etc	特性： ① 绿色节能，效率提升 ② 功率密度提升，体积减小 Characteristics: • Energy conservation, higher efficiency • Increased power density and reduced size

型号命名规则 Model naming rules



机型Model：NSAM120R080CN

- N:N型（N type）
- C:SiC芯片（SiC chips）
- R080:Rdson-80mΩ
- 120:1200V
- M:MOSFET
- A:TO-247-3L
- NS:国星光电（NATIONSTAR）

批号：210520：年月日

Batch number: 210520: (year) (month) (date)

命名规则 Naming rules		
NS	国星光电 NATIONSTAR	
A	A:TO-247-3L	B:TO-247-2L
	C:TO-220-2L	D:TO-220-3L
	E:TO-252-2L	F:TO-263-2L
	G:DFN5*6	H:DFN8*8
	I:TO-247-4L	J:内绝缘系列 Internal insulation series
M	D:二极管 diode	M:MOSFET
	I:IGBT	
120	耐压：如065即650V，120即1200V voltage resistance, such as 065=650V, 120=1200v	
R080	R:MOS-Rdson	A:二极管 diode/IGBT-If
C	C:SiC	N:GaN
N	N:NPN型	P:PNP型

NSiC-650V耐压SBD分立器件 NSiC-650V-SBD

TO-220 TO-247 TO-252 TO-263 DFN

SiC 肖特基二极管产品线 650V系列化封装列表 NSiC-650V-SBD

电压 voltage	电流 Current	TO-220-2L	TO-220F-2L	TO-252-2L	TO-247-2L	TO-247-3L	TO-263-2L	DFN5*6	DFN8*8
650V	2A	●	●	●			●	●	●
	4A	●	●	●			●	●	●
	6A	●	●	●			●	●	●
	8A	●	●	●			●	●	●
	10A	●	●	●	★	★	●		●
	12A	●			●	●	●		
	15A	●			●	●	●		
	16A	●			●	●	●		
	20A	●			★	★	●		
	30A	●			●	●	●		
	40A					●			

★ :布局车规级器件 Vehicle level devices

NSiC-1200V耐压SBD 分立器件 NSiC-1200V-SBD

TO-220 TO-247 TO-252 TO-263 DFN

SiC 肖特基二极管产品线 1200V系列化封装列表 NSiC-1200V-SBD

电压 voltage	电流 Current	TO-220-2L	TO-220F-2L	TO-252-2L	TO-247-2L	TO-247-3L	TO-263-2L	DFN5*6	DFN8*8
1200V	2A	●	●	●			●	●	●
	5A	●	●	●			●	●	●
	10A	●	●	●	★	●	●		●
	13A	●	●	●	●	●	●		
	15A	●		●	●	●	●		
	18A	●			●	●	●		
	20A	●			★	★	●		
	30A				●	●			
	40A					●			
	50A					●			
	60A					●			

★ :布局车规级器件 Vehicle level devices

650V SBD系列型号参数(局部) NSiC-650V-SBD					
型 号 Model	封 装 Package	V_D(V)	I_F(A)	V_F(V)	T_J(°C)
NSCD065A05CS	TO-220-2L	650	5	1.4	150
NSCD065A15CS	TO-220-2L	650	15	1.4	150
NSCD065A30CS	TO-220-2L	650	30	1.4	150
NSAD065A20CS	TO-247-3L	650	20	1.4	150
NSAD065A40CS	TO-247-3L	650	40	1.4	150
NSED065A10CS	TO-252-2L	650	10	1.4	150
NSED065A15CS	TO-252-2L	650	15	1.4	150
NSFD065A15CS	TO-263-2L	650	15	1.4	150
NSFD065A20CS	TO-263-2L	650	20	1.4	150
NSGD065A02CS	DFN5*6	650	2	1.4	150
NSHD065A06CS	DFN8*8	650	6	1.4	150

1200V SBD系列型号参数(局部) NSiC-1200V-SBD					
型 号 Model	封 装 Package	V_D(V)	I_F(A)	V_F(V)	T_J(°C)
NSCD120A02CS	TO-220-2L	1200	2	1.4	150
NSCD120A05CS	TO-220-2L	1200	5	1.4	150
NSCD120A15CS	TO-220-2L	1200	15	1.4	150
NSBD120A15CS	TO-247-2L	1200	15	1.4	150
NSBD120A30CS	TO-247-2L	1200	30	1.4	150
NSAD120A20CS	TO-247-3L	1200	20	1.4	150
NSAD120A40CS	TO-247-3L	1200	40	1.4	150
NSED120A10CS	TO-252-2L	1200	10	1.4	150
NSED120A15CS	TO-252-2L	1200	15	1.4	150
NSFD120A05CS	TO-263-2L	1200	5	1.4	150
NSFD120A10CS	TO-263-2L	1200	10	1.4	150
NSGD120A02CS	DFN5*6	1200	2	1.4	150
NSHD120A06CS	DFN8*8	1200	6	1.4	150

NSiC-高耐压SBD分立器件 NSiC-1700V-SBD


TO-220-2L


TO-247-2L


TO-247-3L

SiC 肖特基二极管产品线 高耐压系列化封装列表 NSiC-1700V-SBD			
电 压 Voltage	电 流 Current	TO-220-2L	TO-247-2L
1700V	5A	●	●
	10A	●	●
	15A		●
	20A		●
	30A		●
	50A		●

高耐压SBD系列型号参数 NSiC-1700V-SBD					
型 号 Model	封 装 Package	V_D(V)	I_F(A)	V_F(V)	T_J(°C)
NSCD170A05CS	TO-220-2L	1700	5	1.5	150
NSCD170A10CS	TO-220-2L	1700	10	1.5	150
NSBD170A05CS	TO-247-2L	1700	5	1.5	150
NSBD170A10CS	TO-247-2L	1700	10	1.5	150
NSBD170A15CS	TO-247-2L	1700	15	1.5	150
NSBD170A25CS	TO-247-2L	1700	25	1.5	150
NSBD170A30CS	TO-247-2L	1700	30	1.5	150

NSiC-1200V以上耐压MOS分立器件 NSiC-1200V-MOS

TO-220 TO-263 TO-247-3 TO-247-4

MOSFET系列型号参数(局部) NSiC-1200V-MOS

电 压 voltage	I_D (A)	R_{DSON} (mΩ)	Q_G (nC)	E_{ON} (uJ)	E_{OFF} (uJ)	封装结构 Package			
						TO-220-3L	TO-263-3L	TO-247-3L	TO-247-4L
1200V	18	160	49	315	63	●	●	●	●
	36	80	79	560	260			★	★
	40	80	159	354	185				●
	60	40	142	1100	850				●
	150	15	230	850	390				●
1700V	72	45	-	-	-				●
	40	80	-	-	-				●

★ :布局车规级器件 Vehicle level devices

1200V MOSFET系列型号参数(局部) NSiC-1200V-MOS

型 号 Model	封 装 Package	V_D(V)	I_F(A)	R_{DSON}(mΩ)	T_J(°C)
NSDM120R160CN	TO-220-3L	1200	13	160	150
NSFM120R160CN	TO-263-2L	1200	13	160	150
NSAM120R160CN	TO-247-3L	1200	13	160	150
NSAM120R080CN	TO-247-3L	1200	40	80	150
NSAM120R080CN	TO-247-3L	1200	44	80	150
NSAM120R032CN	TO-247-3L	1200	84	32	150
NSAM120R018CN	TO-247-3L	1200	110	18	150
NSIM120R080CN	TO-247-4L	1200	44	80	150
NSIM120R032CN	TO-247-4L	1200	84	32	150
NSAM170R045CN	TO-247-3L	1700	72	45	150
NSAM170R080CN	TO-247-3L	1700	40	80	150
NSAM170R080CN	TO-247-4L	1700	40	80	150

NSiC-650V耐压MOS分立器件 NSiC-650V-MOS

TO-220 TO-263 TO-247-3 TO-247-4

MOSFET系列型号参数(局部) NSiC-650V-MOS

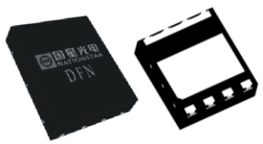
电 压 voltage	I_D (A)	R_{DSON} (mΩ)	Q_G (nC)	E_{ON} (uJ)	E_{OFF} (uJ)	封装结构 Package			
						TO-220-3L	TO-263-3L	TO-247-3L	TO-247-4L
650V	15	160	-	-	-	●	●	●	●
	25	120	-	-	-			●	●
	45	80	-	-	-			●	●
	68	40	-	-	-			●	●

★ :布局车规级器件 Vehicle level devices

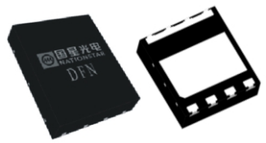
650V MOSFET系列型号参数(局部) NSiC-650V-MOS

型 号 Model	封 装 Package	V_D(V)	I_F(A)	R_{DSON}(mΩ)	T_J(°C)
NSDM065R160CN	TO-220-3L	650	15	160	150
NSFM065R160CN	TO-263-2L	650	15	160	150
NSAM065R160CN	TO-247-3L	650	15	160	150
NSAM065R080CN	TO-247-3L	650	45	80	150
NSAM065R080CN	TO-247-4L	650	45	80	150
NSAM065R040CN	TO-247-3L	650	68	40	150
NSAM065R120CN	TO-247-3L	650	25	120	150
NSIM065R120CN	TO-247-4L	650	25	120	150
NSIM065R040CN	TO-247-4L	650	68	40	150

NSGaN器件产品DFN封装外形 The package series of GaN products

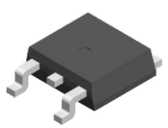


DFN 5*6

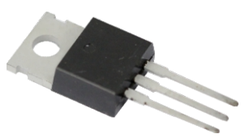


DFN 8*8

TO-252



TO-263



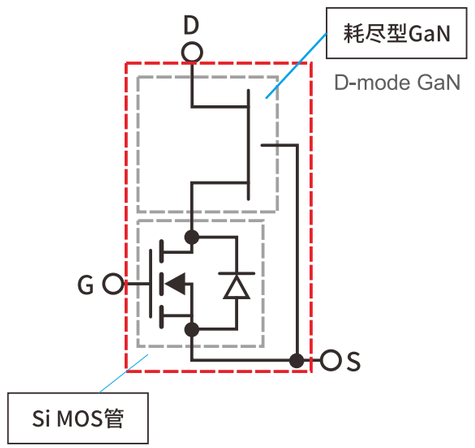
TO-220

GaN分立器件系列型号（局部） GaN products

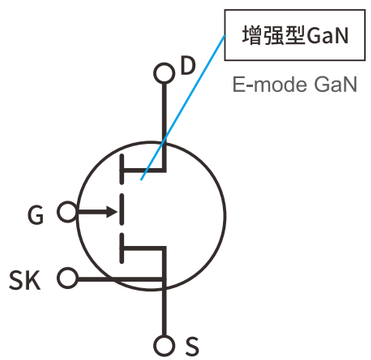
型 号 Model	Vdss	Vgs(th)	Id	Rds(on)	模 式 Structure
NSGM065R150NE	650V	1.5V	17A	150(mΩ)	E-mode
NSGM065R240NE	650V	1.5V	12A	240(mΩ)	E-mode
NSGM065R480NE	650V	1.5V	8A	480(mΩ)	E-mode
NSHM065R160NC	650V	2.0V	16A	160(mΩ)	Cascode
NSHM065R270NC	650V	2.0V	8A	270(mΩ)	Cascode
NSHM065R600NC	650V	2.0V	4.5A	600(mΩ)	Cascode

NSGaN芯片DFN封装原理 DFN-GaN schematic diagram

MOS管与GaN管合封构成Cascode结构
Cascode structure

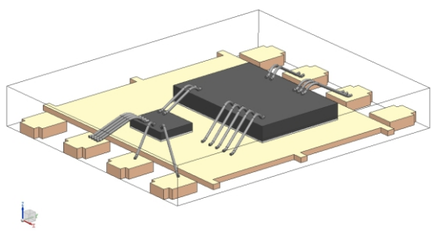


单颗芯片形成结构
Single chip structure

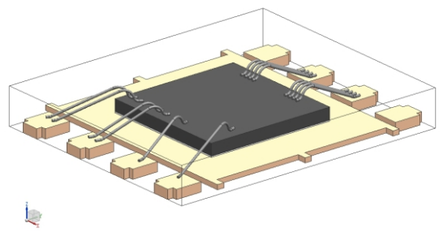


使用耗尽型GaN的器件
Cascode GaN

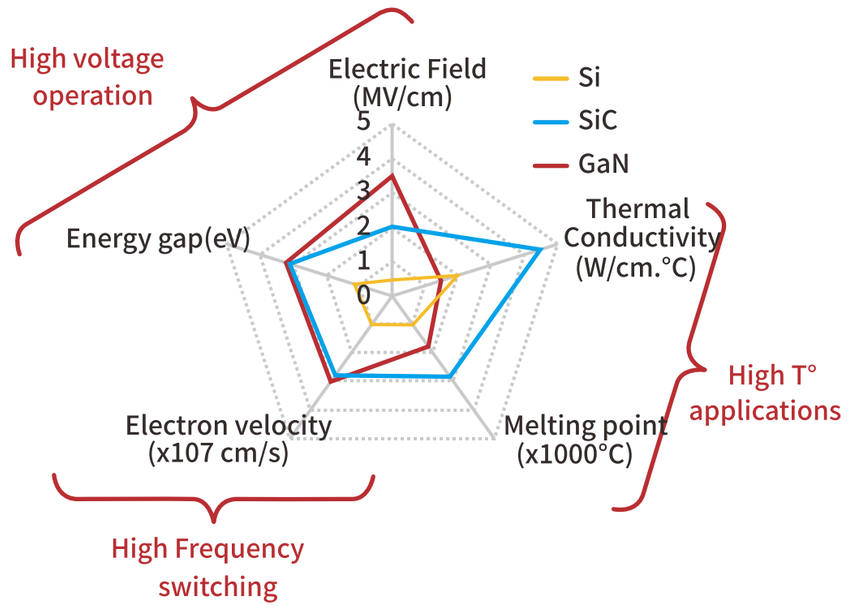
使用增强型GaN的器件
E-mode GaN



Cascode内部打线图
Cascode GaN

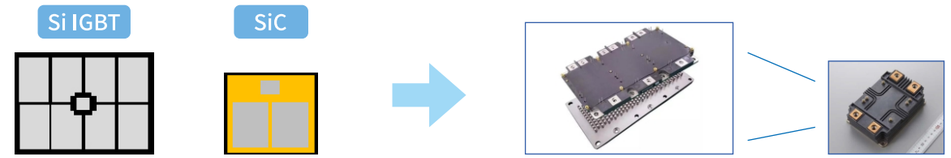


E-Model内部打线图
E-mode GaN



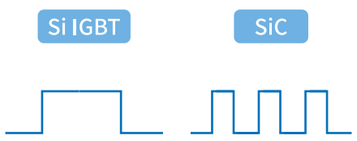
更小的芯片尺寸/更低的阻抗
Smaller chip size/lower impedance

更小的尺寸/更高的效率
Smaller device size/higher efficiency

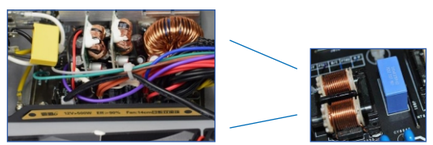


更高的开关频率
Higher switching frequency

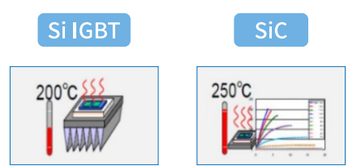
更小的被动元器件
Smaller passive components

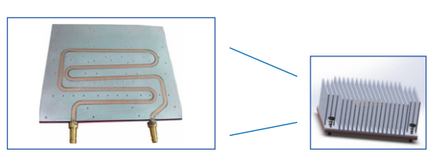


更高的温度耐受能力
Higher temperature resistant



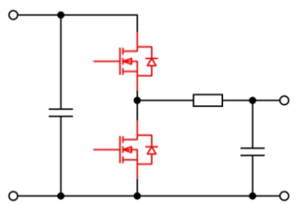
更简单的散热设计
Simpler heat dissipation design

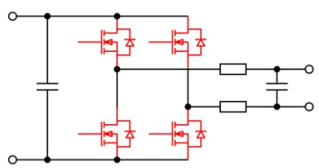




* 本页图示来源于网络
From Internet

功率模块-内部电路 Power module-circuit topology

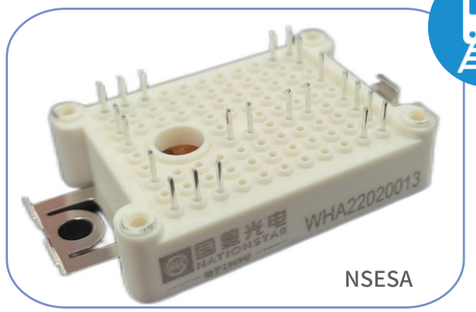




功率模块-标准系列产品 Power module series products

NS34M

NS62M



NSESA

NSECO

功率模块-标准系列产品 Power module series products

封装模块 Package	V_{DS}	I_{DS}(25℃)	Technology	示意图 Diagram
NS34M	1200V	36A,70A,100A	2 in 1	
NS62M	1200V	36A,70A,100A, 120A,200A,300A		
NSESA	1200V	36A,70A,100A, 120A,200A,300A	2 in 1 4 in 1 6 in 1	
NSECO	1200V	36A,70A,100A, 120A,200A		

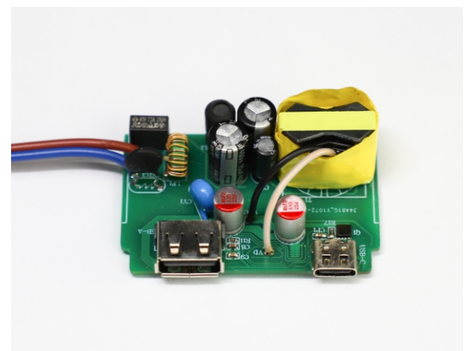
功率模块-多渠道联合开发 Power module-multi-channel joint development

采取联合开发、定制化模块的合作方式，实现产品到终端的高契合度应用、低成本优势SiC模块方案联合开发，针对性解决模块应用开发过程中的问题，解决诸如电磁兼容、失效分析、寿命测试等问题。

We adopt the mode of joint development, customized module cooperation, in order to achieve high fit products to terminal application, low cost advantage of SiC module scheme. We solve the problems in module application development process, such as electromagnetic compatibility, failure analysis, the problem such as life test.

* 本页图示来源于网络
From Internet

墙插类快充 Wall socket type quick charge



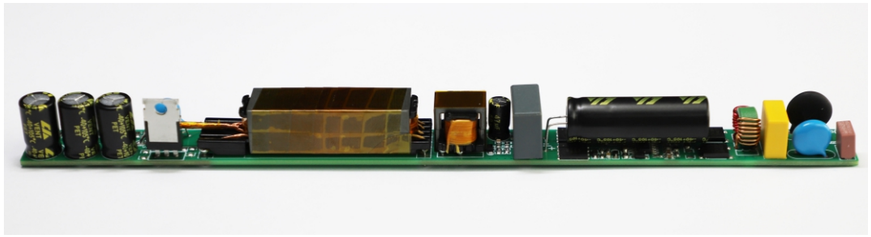
更小、更轻、更高功率
Smaller, lighter, more power

- 搭载GaN的新一代墙插面板，发热小、效率高、寿命长；
- 智能负载调控、超低空载损耗；
- 简洁时尚，诠释现代美学，适合所有装饰风格；
- 选用进口优质PC料，韧性高、阻燃性能强；
- 插座铜片采用优质锡磷青铜，强度高、弹性好、导电性能高。

- Pick up a new generation of GaN Wall socket, low fever, high efficiency, long service life;
- Intelligent load regulation, low no-load loss;
- Concise fashion, the interpretation of modern aesthetics, suitable for all adornment style;
- Selects the import high quality PC material, high toughness, flame retardant performance;
- Socket copper is made of high quality tin phosphor bronze, high strength, good elasticity, high electrical conductivity.

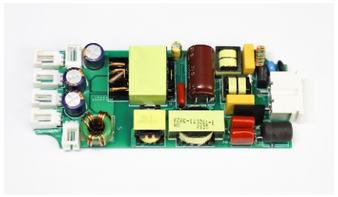
型号 Model	输入电压 Input voltage	功率因数 Power factor	输出功率 Output power	空载功率 No-load power	能效 Efficiency	尺寸 Size	支持协议 Support protocol	安规认证 Safety certification
35W墙插	180-240 VAC	0.65	35W	<0.3W	92%	54*35	FCP/SCP/AFC/ QC3+/SFCP/PD3.0 PPS QC4+/DCP/ AP PLE 2.4A	符合3C

LED驱动电源 LED driver



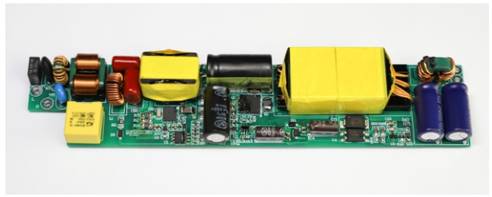
200W磁吸灯驱动

200W driver for magnetic suction light



120W橱柜灯驱动

120W driver for Ambry light



120W磁吸灯驱动

120W driver for magnetic suction light

基于LLC拓扑，采用GaN FET相比传统Si MOSFET：

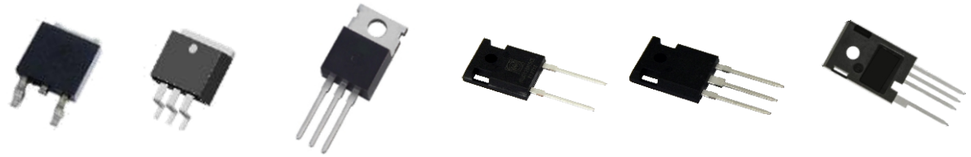
- 绿色节能，效率实现2%左右的提升；
- 功率密度提升40%，体积减小30%；
- 优化热设计、方案更灵活、降低总成本；
- 产品小型化，市场应用多元化。

- Green, energy saving, efficiency achieve 2%;
- Up 40% power density and the volume of 30%;
- Optimization of thermal design, the solution is more flexible, reduce total cost;
- Diversified product miniaturization, the market application.

型号 Model	输入电压 Input voltage	功率因数 Power factor	输出功率 Output power	输出电压 Output voltage	输出电流 Output current	能效 Efficiency	尺寸 Size
NS200-48V	180-264 VAC	0.65	200W	48VDC	4.2A	94%	235*18*18 mm
NS120-24V	180-264 VAC	0.95	120W	24VDC	5.0A	93%	126*50*18 mm
NS120-24V	180-264 VAC	0.95	120W	24VDC	5.0A	91%	145*145*15.5 mm

封装类型 Package series

TO Series

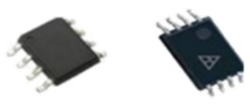


TO-252 TO-263 TO-220 TO-247-2L TO-247-3L TO-247-4

SOT/SOD Series

SOD123 TO-251 SOT23-3 SOT89-6 SOT223

SOP Series

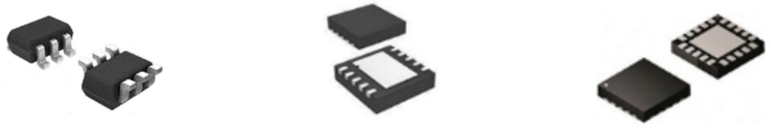


SOP8 ESOP8

IC Series

SOT323 TSOP23-5-6-8

Small Series



SOT363 DFN2*2/3*3/5*6/8*8 QFN5*5/4*4/3*3

国星光电在硅基器件封测上，以TO、SOP、SOT等分立器件常规封装规格为主要抓手，在DFN、QFN等扁平无引脚封装规格上做延伸；进而布局LQFP、BGA、Flip Chip等新型封装产品。

Third generation semiconductor products of Nationstar are mainly the package of TO, SOP, DFN, QFN and SOT. And we are simultaneously laying out our products in LQFP, BGA, Flip Chip and other new package types.

封装工艺 Packaging technologies

装配工序
Production technology

- 晶圆减薄
  Wafer thinning
- 封装
  Packaging process
  分立器件
  集成IC
  Discrete device and integrated circuit

测试工序
Test technology

- SiC芯片
  SiC chip
- GaN芯片
  GaN chip
- Si 芯片
  Si chip

包装工序
Encapsulation technology

- 编带包装
  Braid packaging
- 管料保证
  Material guarantee
- 客制包装
  Custom packaging

封测产能 Capacities

	封装 Package	产能Capacities(KK/M)
SOT/SOD	SOT23/SOD123	300
	SOT323/363	70
	SOT23-3-5-6/TSOT23-5-6-8	80
	SOT89/SOT223	30
SOP/TSSOP	SOP7/SOP8/ESOP8/TSSOP8	120
	eTSSOP28	Target to 10KK
TO	TO220AB/TO263AB/TO220FP	15
	TO251/252	10
QFN/DFN	2x2 /2x3 /3x3 /4x4 /5x5/5x6/8x8	20
Total		650

AEC-Q101可靠性实验室 AEC-Q101 Reliability Laboratory

产品类别 Product category	测试项目 Test items	测试条件 Test conditions	失效/数量 Invalid/Quantity
ALL	AC	96小时 TA = 121°C, 100%RH , 15psig 96 hours, 121° C, 100% RH, 15psig	0/77*3Lot
	TCT	1000个循环，-55°C至+150°C ，约1小时1个循环 1000 cycles, -55° C ~ +150° C, 1 hour per cycle	0/77*3Lot
	H3TRB	1000h，85°C & 85%RH，反向偏压80%V_{DS} 1000h, 85° C, 85% RH, V_{DS}=80% V_{max}	0/77*3Lot
	HAST	1）96h，130°C & 85%RH 反向偏压80%V_{DS} 1) 96h, 130° C, 85% RH, V_{DS}=80% V_{max} 2）264h，110°C & 85%RH 反向偏压80%V_{DS} 2) 264h, 110 ° C, 85% RH, V_{DS}=80% V_{max}	0/77*3Lot
	HTRB	1000小时,施加用户规范或产品规格书最高直流反向额定电压，TA要根据漏电损耗做相应调整使器件工作在最高结温175°C 1000h, 150° C, V_{DS}=80% V_{max}	0/77*3Lot
	IOL	1）△T_J=100°C，60000/（X+Y），max=1.5W次循环 1) ΔT_j=100° C, 60000/(X+Y), max=1.5W cycles 2）△T_J=125°C，30000/（X+Y），max=0.75W次循环 2) ΔT_j=125° C, 30000/(X+Y), max=0.75W cycles	0/77*3Lot
Only FETs	HTGB	1000小时 施加用户规范或产品规格书中的最高栅极电压，TA要根据漏电损耗做相应调整使器件工作在最高结温175°C 1000h, 150° C, V_{GS}=80% V_{max}	0/77*3Lot
	SSOP	额定电流I_F下，保持T_J<max，正常运行1000h I_{max}, T_J<150 ° C, 1000h	0/77*3Lot
	ACBV	V_{GS}关断，交流电压≈BVDS，保持T_J≈max，正常运行1000h V_{GS} off, V_{DS}(AC)=BVDS, 150 ° C, 1000h	0/77*3Lot

联合开发: 以项目合作的形式,协助客户开展产品的设计开发,技术迭代,从而实现互利共赢的抱团合作的新模式。

自主产品: 以国星光电品牌为主推的产品,向市场端提供器件产品。

封测代工: 以国星光电半导体封测产能为依托,为客户提供封测代工服务,可实现为客户贴牌生产,测试等服务。

测试服务: 以国星光电CNAS及三代半AEC-Q101可靠性实验室平台为依托,为客户提供样品可靠性测试服务。

• **Joint development:** In the form of project cooperation, assist customers in product design and development, technical iteration, and achieve a new model of mutually beneficial and win-win cooperation.

• **Autonomous products:** products mainly promoted by the Nationstar brand, providing device products to the market.

• **Packing, testing and OEM:** relying on the capacity of Nationstar Semiconductor, we provides customers with the packing, testing and OEM services, which can realize original equipment manufacturer, testing and other services for customers.

• **Testing services:** Based on the Nationstar CNAS and the third-generation semiconductor AEC-Q101 reliability laboratory platform, we provide sample reliability testing services to customers.

* 本页图示来源于网络
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