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股票代码: 002449



Mini LED

产品手册

RGB战略管控型事业部
RGB LED DIVISION

 **佛山市国星光电股份有限公司**
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佛山市国星光电股份有限公司（股票代码：002449）成立于1969年，是专门从事研发、生产、销售LED及LED应用产品的国家高新技术企业。2018年Q2营收位列全球LED封装厂TOP8（IHS Markit）。

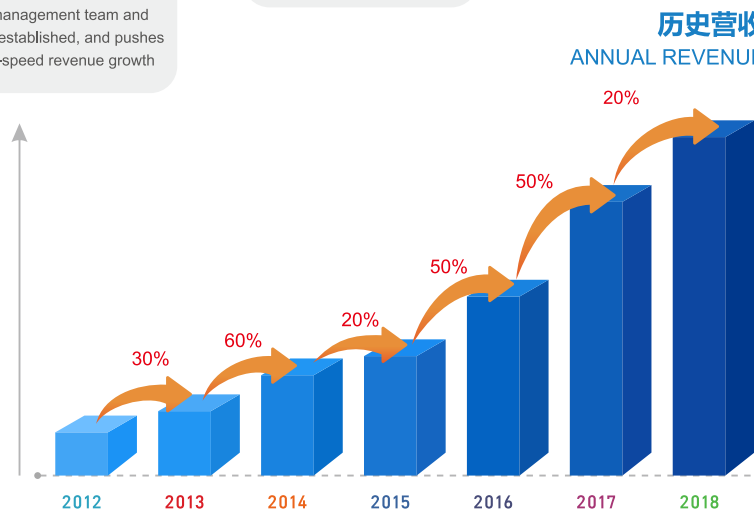
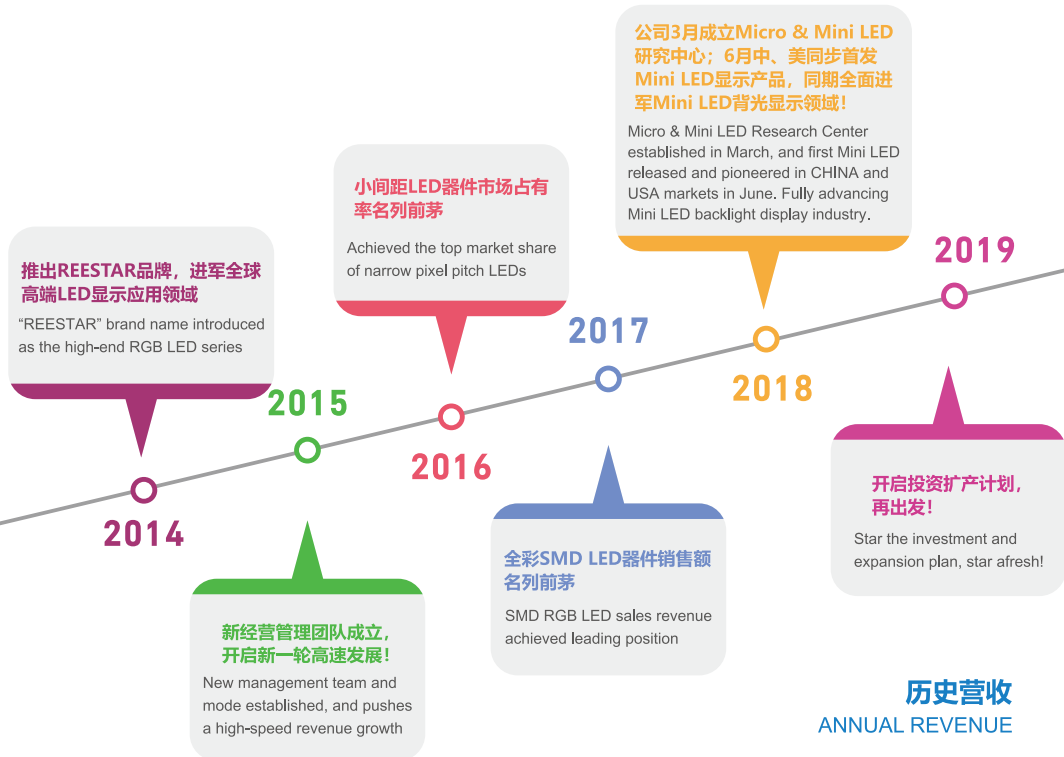
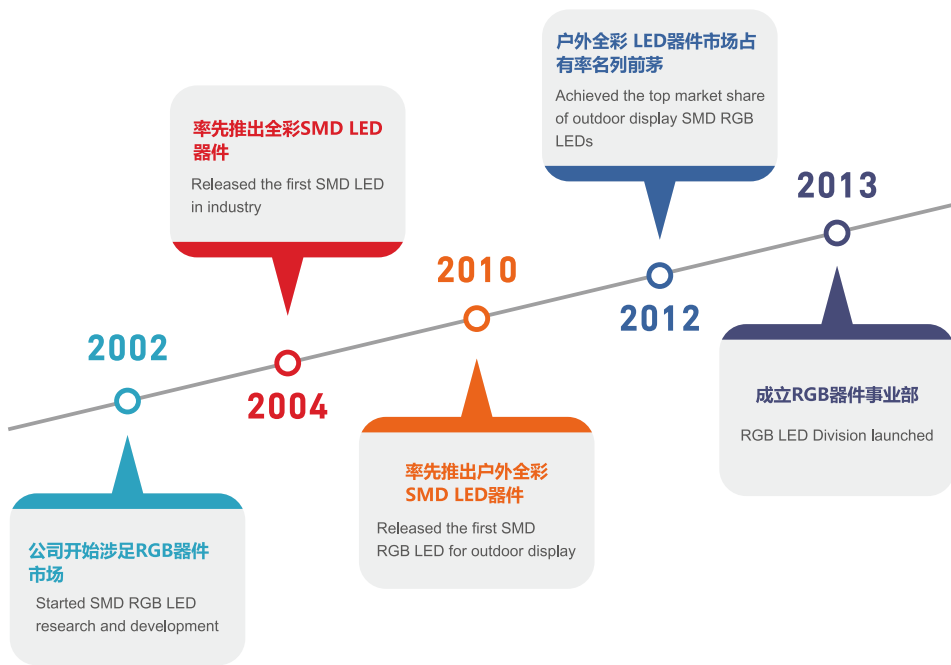
RGB器件事业部是国星光电营业额最大的事业部，其致力于研发、生产、销售LED显示器件、Mini LED显示及Mini LED背光产品。

Foshan NATIONSTAR Optoelectronics Co.,Ltd. (SZ stock exchange market code: 002449) was established in 1969, it started to specialized in LED and LED applied products development, manufacturing and sales since 1976. Global TOP 8 LED Encapsulation Manufacture in Q2 2018 (IHS Markit) .

RGB LED Division is the biggest division in NATIONSTAR company. It has been dedicated to develop, manufacture, and sell various SMD RGB display LEDs, as well as Mini LED backlight products.

RGB器件事业部发展历程

RGB LED DIVISION HISTORY



Micro&Mini LED研究中心简介

BRIEF INTRODUCTION OF MICRO & MINI LED RESEARCH CENTER

随着LED显示进入更高层次的技术探索阶段，Micro LED & Mini LED已经成为超高清LED显示领域发展的主要趋势。为推动该趋势产业化，国星光电于2018年3月2日率先成立Micro & Mini LED研究中心。6月8日，首款Mini LED全球首发会在广州香格里拉大酒店隆重召开，并在美国Infocomm视听展上同步公开展示。该首款Mini LED（型号IMD-M09）的发布标志着LED显示行业正式步入P0.X时代。

Micro & Mini LED研究中心将致力于Mini LED显示（Pitch: 0.1-0.9mm）和Mini LED背光显示模组的发展、柔性曲面Mini LED显示技术的开发、Micro LED转移及相关技术的开发，力争形成一批具有自主知识产权的技术成果，推动新技术的普及、应用及标准制定，打造国际LED显示封装前沿关键技术的创新基地，引领全球显示封装行业不断实现新高度！

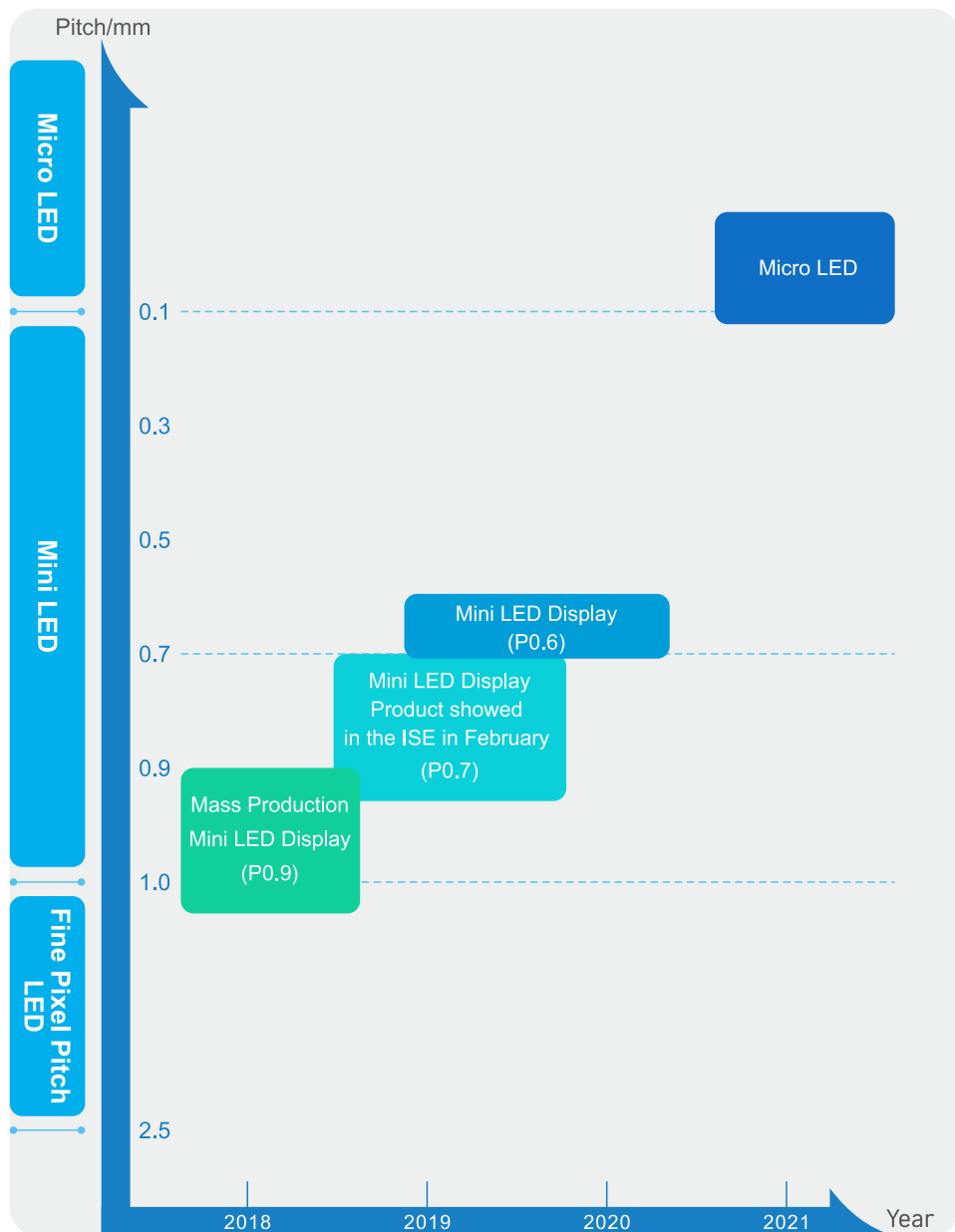


With the rapid trend of exploring higher LED display technology, Micro LED and Mini LED has become the major hot directions for high-end display. As a RGB packaged LED industrial leader, NATIONSTAR set up the Micro & Mini LED Research Center on March 2nd, 2018. Following up, on June 8th the first Mini LED item was released in Guangzhou China and Infocomm Audiovisual Exhibition in USA at the same time, which is an important event to announce that the LED display starts the pitch below 1mm (P0.X era).

The Micro & Mini LED Research Center focuses on the development of Mini LED for display pitch ranges 0.1-0.9mm, Mini LED backlight module, packaged Mini LED for soft and curved screen, Micro LED chip massive transfer technology, and etc. This Research Center set these targets: applying the many Micro & Mini LED intellectual property rights, pushing the application of new technologies and standards, creating an innovation base for the key technologies, and leading the global display LED industry to new heights!

Mini LED显示 Road map

MINI LED ROADMAP - FOR DISPLAY APPLICATION



首款IMD产品2018年6月发布并已实现量产

The first IMD product was released and mass production was launched in June 2018

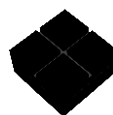
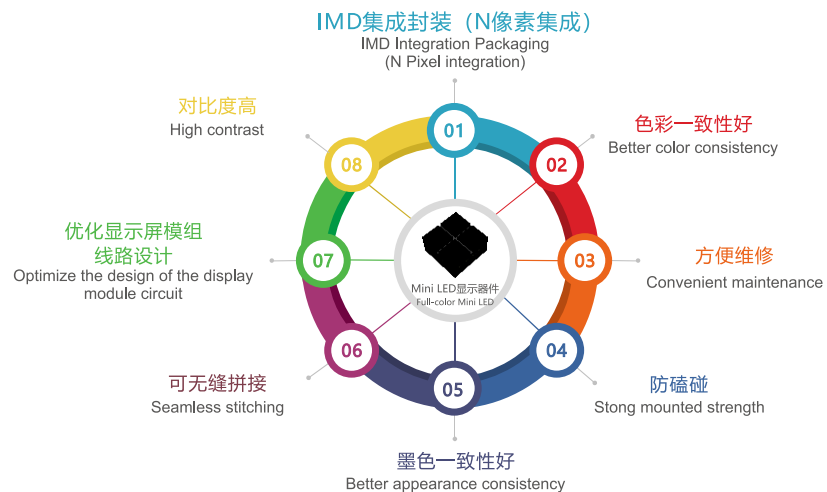
Mini LED显示产品及优势介绍

INTRODUCTION OF MINI LED FOR DISPLAY APPLICATION

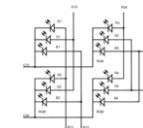
Mini LED显示器件基于IMD (Integrated Mounted Device)集成封装技术通过内部电路连接将相互关联的多个元器件集成封装在一个封装体中, 在P1.0以下的Mini LED显示方面具有极大的应用前景。Mini LED显示产品优点如下:

Mini LED Display is an component based on the IMD type device (Integrated mounted device) with the packaging technology. It can integrate multiple components into one package by internal circuit connection. This technology meets various great application prospects in ultra-high density display.

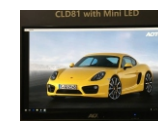
Advantage of Mini LED Display Product:



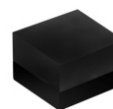
IMD-M09产品图
IMD-M09 Product Image



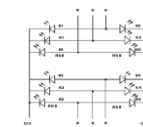
集成电路图
Integrated Circuit Diagram



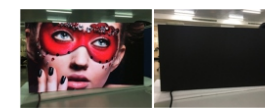
产品应用
LED Application



IMD-M07产品图
IMD-M07 Product Image



集成电路图
Integrated Circuit Diagram



产品应用
LED Application

产品	对比度	亮度cd/m2	点间距	2K	4K	8K
M09T	6000:1	600	0.9	81吋	162吋	324吋
M07	12000:1	1200	0.7	65吋	136吋	272吋

Mini LED背光 Road map

MINI LED ROADMAP - FOR BACKLIGHT APPLICATION



Mini LED背光产品已具备批量供货产能

Mini LED backlight products have already mass production capacity

Mini LED背光产品优势介绍及应用

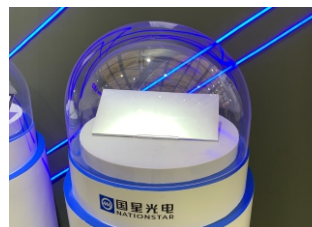
ADVANTAGE AND APPLICATION INTRODUCTION OF MINI LED BACKLIGHT PRODUCT

Mini LED背光产品主要应用于高端液晶显示 (LCD)。Mini LED背光的精细分区结合区域调光技术 (Local Dimming)、量子点 (QD) 技术, 给LCD画质带来全面的提升, 使得LCD在宽色域 (BT.2020)、高对比度 (100000:1)、薄型化 (OD~0) 等方面与OLED相媲美。目前国星自主研发的大尺寸、薄型化、超短距离混光封装技术, 大大提升了Mini LED背光的组装效率, 减薄了LCD的厚度。在大尺寸 (≥65吋) 4K/8K LCD TV、商业显示器、医疗显示器、电竞显示器、笔电、车载显示、PAD等方面极具应用前景!

Mini LED 背光的优点概括如下:

Mini LED Backlight products are mainly used in high-end LCD. With the refined partition and Local Dimming technology and Quantum Dot (QD) technology, LCD display quality could be greatly improved. Mini LED Backlight enhanced LCDs with wide color gamut (BT.2020) and ultra high contrast (100000:1) performances and ultra-thin (OD~0mm) are comparable with the OLED. The large size, ultra-thin, short-distance light-mixing Mini LED backlight modules are independently developed by NATIONSTAR. And NATIONSTAR's Mini LED backlight greatly improves the assembly efficiency of Mini LED backlight and reduces the thickness of LCD, which has a great application prospects in large size (≥65-inch) 4K/8K LCD TV, Commercial Monitor, Medical Monitor, Gaming Monitor, Notebook, Automotive display, PAD, etc.

Mini LED backlight products have the following advantages:



Mini LED背光应用案例

APPLICATIONS OF MINI LED BACKLIGHT



华星75吋圆角窄边显示屏



TCL集团65吋电视

Mini LED显示应用案例

APPLICATIONS OF MINI LED DISPLAY



IMD-M09T 艾比森CR0.9微间距高清屏



IMD-M09T 易事达2K屏

Mini LED显示应用案例

APPLICATIONS OF MINI LED DISPLAY



IMD-M09T 南京公安局专业会议室屏

Mini LED显示应用案例

APPLICATIONS OF MINI LED DISPLAY



媲美液晶的IMD-M07亮相上海UDE展



IMD-M07 在美国Infomomm发布



媲美液晶的IMD-M07亮相上海UDE展