



2015

NATIONSTAR

DA LEDs For Display Applications

FOSHAN NATIONSTAR OPTOELECTRONICS CO.,LTD

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NATIONSTAR
— SINCE 1969 —

Profession Achieved From History, Specialization Enhances Quality



NationStar Headquarters

Total Land Area: 123,000m²

Total Building Area: 309,000m²

Company Profile

Foshan NationStar Optoelectronics Co.Ltd is a key hi-tech enterprise of the National Torch Plan, and excellent high-tech enterprise of Guangdong Province, who specializing in manufacturing LED and LED applied products. Production bases cover total area of 123,000m², while workshops and offices building area 309,000m². Company founded in 1969, with advantages on capital, distribution channels, R&D, and management, it has been ranked in the list of the famous LED brands. On 16th July, 2010, it launched its initial public offering and was listed in Shenzhen Stock Exchange.

Innovation promotes development, and technology leads to the future. The company is equipped with the post-doctoral science workstation, the enterprise technology center of Guangdong province, the optoelectronics research center of Guangdong province, and the research office of Prof Su Qiang, academican of China Academy of Science, and the local and national united engineering laboratory of semiconductor lighting materials and devices. In recent years, the company has undertaken various R&D projects supported by the national and local government. In addition, the products of NationStar have been granted with a lot of national and provincial honors.

Distribution Network

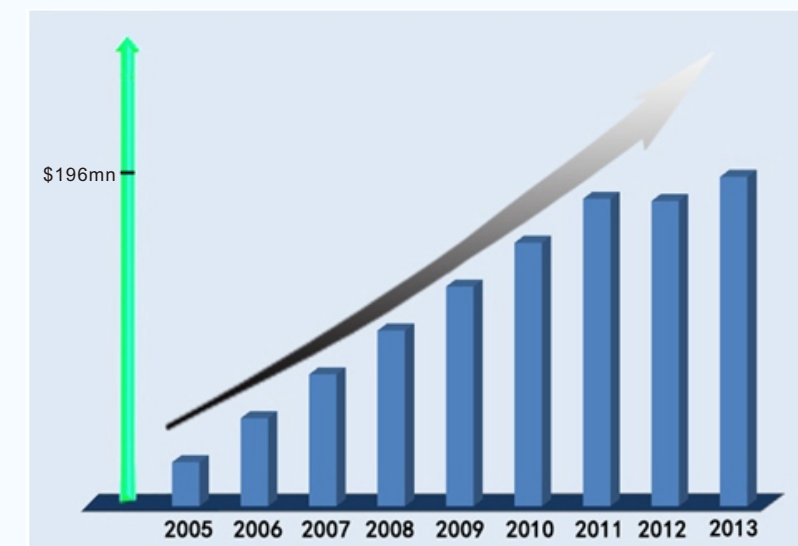
NationStar's important customers are located in many countries and areas. With sincere communication and cooperation, win-win partnership between NationStar and customers will push forward the LED industry and technology.



Sales Volume

NationStar achieved average **25%** annual sales volume growth in the past **9** years.

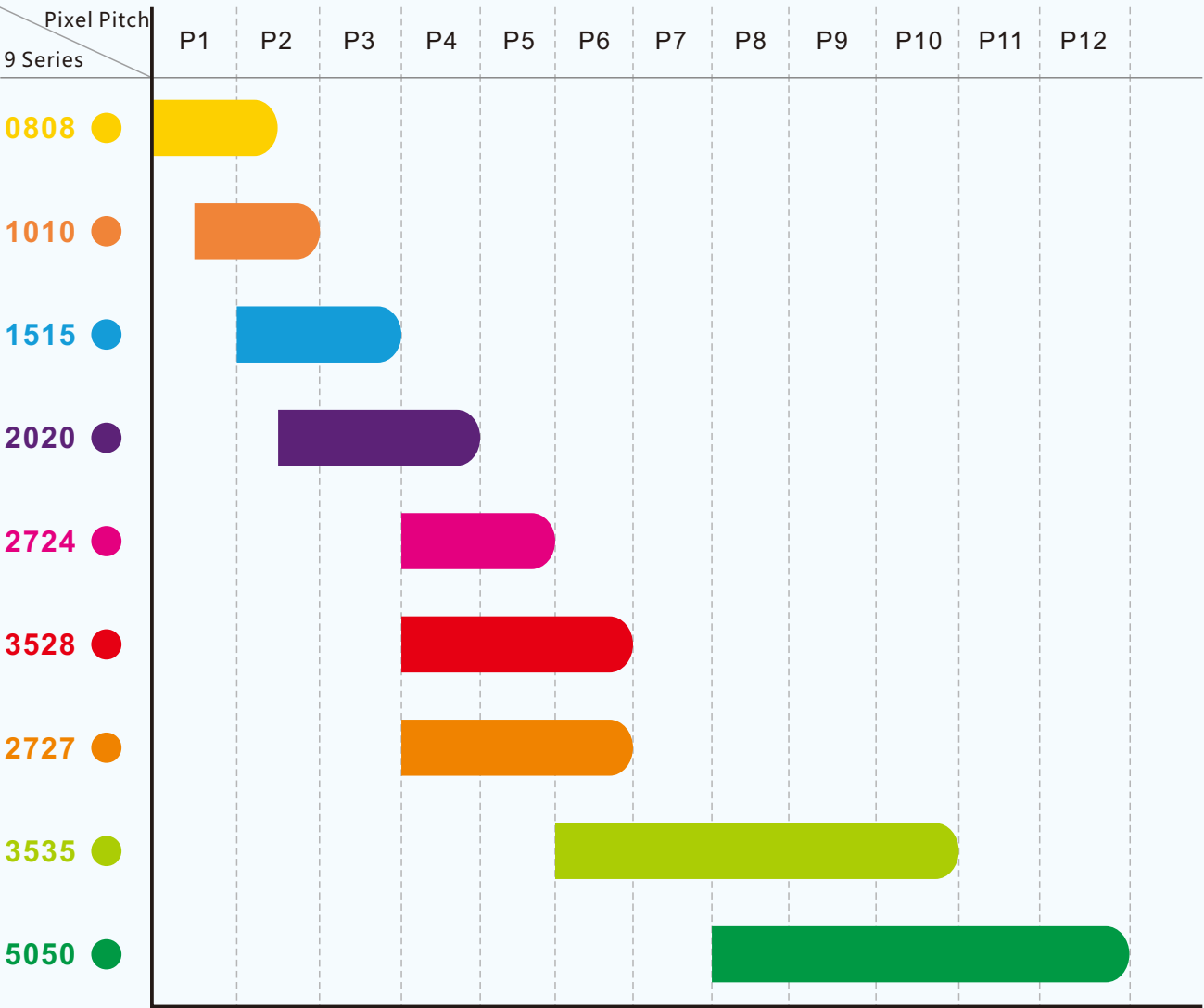
2013 turnover: **\$196mn**, increased by **20.5%** compared with last year.



NationStar RGB Products Target Application

NationStar RGB LED include 9 series, from 0808 to 5050 .with different brightness and pixel pitch levels.

(unit:mm)



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ReeStar™ RGB LED Introduction

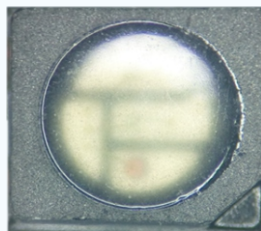
Qualified for Automotive Grade Discrete Semiconductors (AEC-Q101)

Failure rate < 10PPM

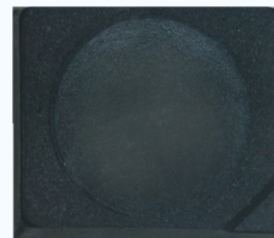
ReeStar™ (hereinafter refer to “RS”), launched out in 2013, engineered for high-end display market, well accepted by **high definition, great contrast, better waterproof level, absolute reliability and low lumen attenuation.**

RS 3 Structure Advantages

1. Matte Encapsulation Technology , High contrast

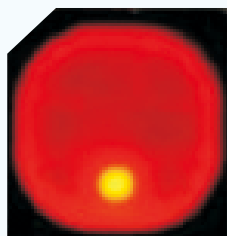


Common

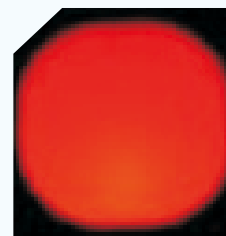


RS

2. Even Emitting Technique ----- No glaring



Common



RS

3. High Frame with low Pins--- Flexible for glue-filling and covering



Common



RS

RS 7 Performance Advantages

1. Waterproof & Anti-Moisture

Water-resistant (IPX8). Reference standard: IEC-60529.

Moisture-sensitivity level: 2a. Reference standard: J-STD-020D.

2. Wide Working Temperature

Pass thermal shock test with temperature from -60°C ~ +150 °C.

Reference standard: AEC-Q101.

3. Anti-Reverse Bias

Supports high refresh rate. No failure under the condition of reverse voltage 8V, 85°C and 85%RH.

Reference standard: AEC-Q101.

4. Resist to Corrosion

Pass salt spray test. Reference standard: AEC-Q101.

5. Anti-UV

Simulate 3 years outdoor use, lumen attenuation <20%.

Reference standard: ASTM-G154.

6. Long Lifespan


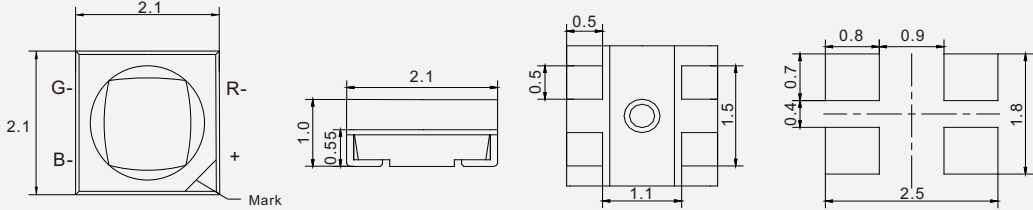
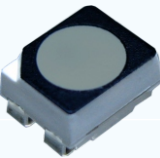
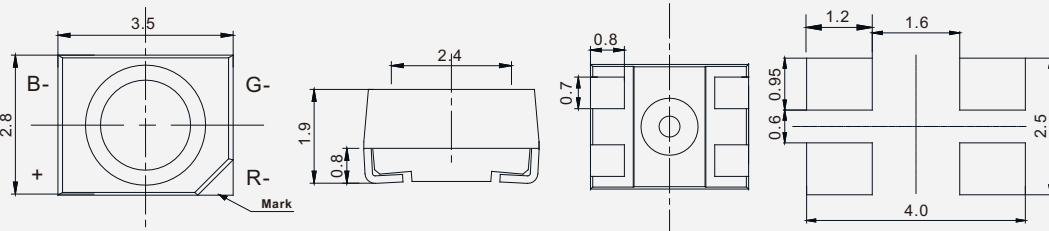
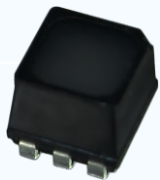
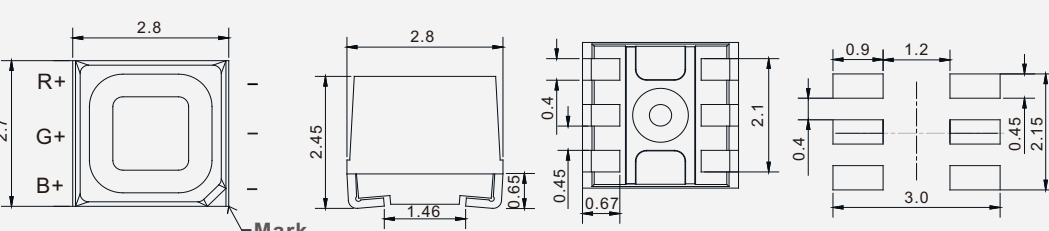

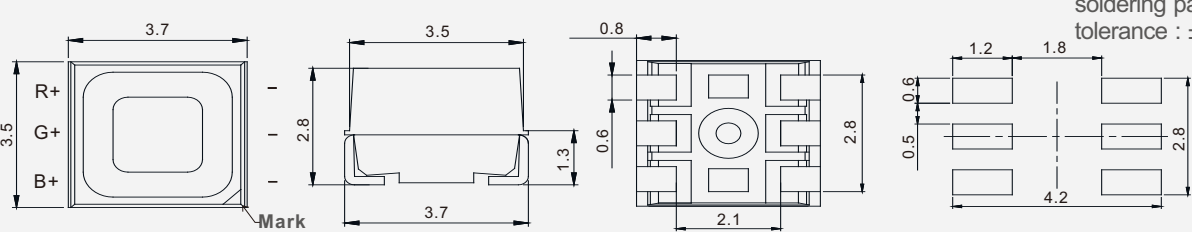
MTBF: 3 years under high temperature and damp environment, lumen attenuation <20%. Reference standard: AEC-Q101.

7. High Brightness

The brightness is the most advanced among the LED industry.

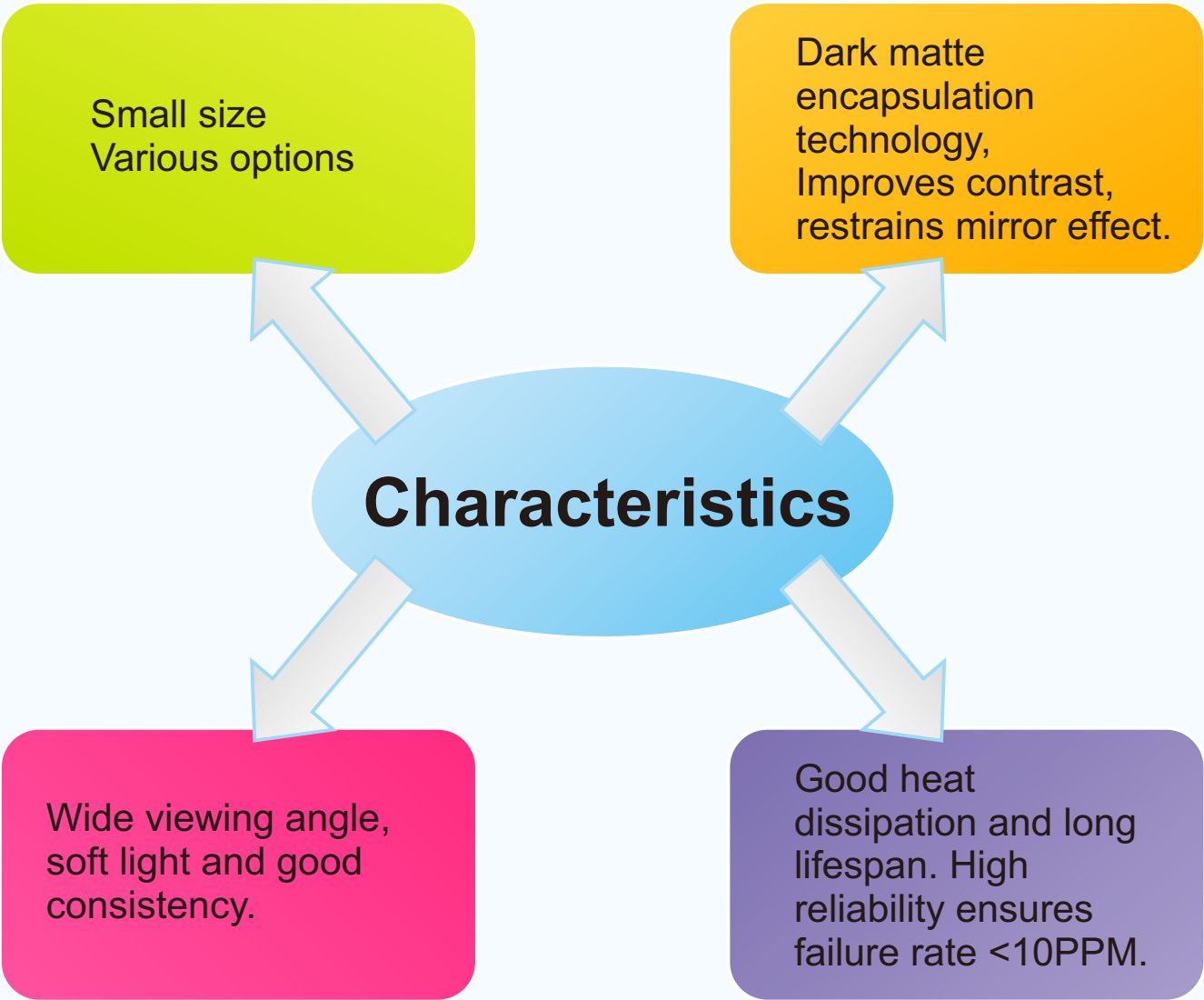
ReeStar™ Outline

ReeStar™ Outline

Product Name	Picture	Color	I _F (mA) TEST	λ _D (nm) Typ.	I _V (mcd) Typ.	V _F (V) Typ.	View angle (deg.)	Dimensions (mm)
RS-2020MBAP			15	620	330	2.0	110	 <div>Recommended soldering pad tolerance : ± 0.2mm</div>
			8	520	550	3.0	110	
			5	470	70	3.0	110	
RS-3528MWAP			20	620	730	2.0	110	 <div>Recommended soldering pad tolerance : ± 0.2mm</div>
			12	520	1400	3.0	110	
			12	470	290	3.0	110	
RS-2727MBAP			20	620	300	2.0	110	 <div>Recommended soldering pad tolerance : ± 0.2mm</div>
			15	520	480	3.0	110	
			10	470	70	3.0	110	
RS-3535MBAS			20	620	445	2.0	110	 <div>Recommended soldering pad tolerance : ± 0.2mm</div>
			20	520	1150	3.0	110	
			20	470	225	3.0	110	

Small Pixel Pitch RGB LED Introduction

There are 3 different series of small pixel pitch RGB LED, 0808, 1010 and 1515 LED. These products have advantages of good heat dissipation, high reliability and good contrast.

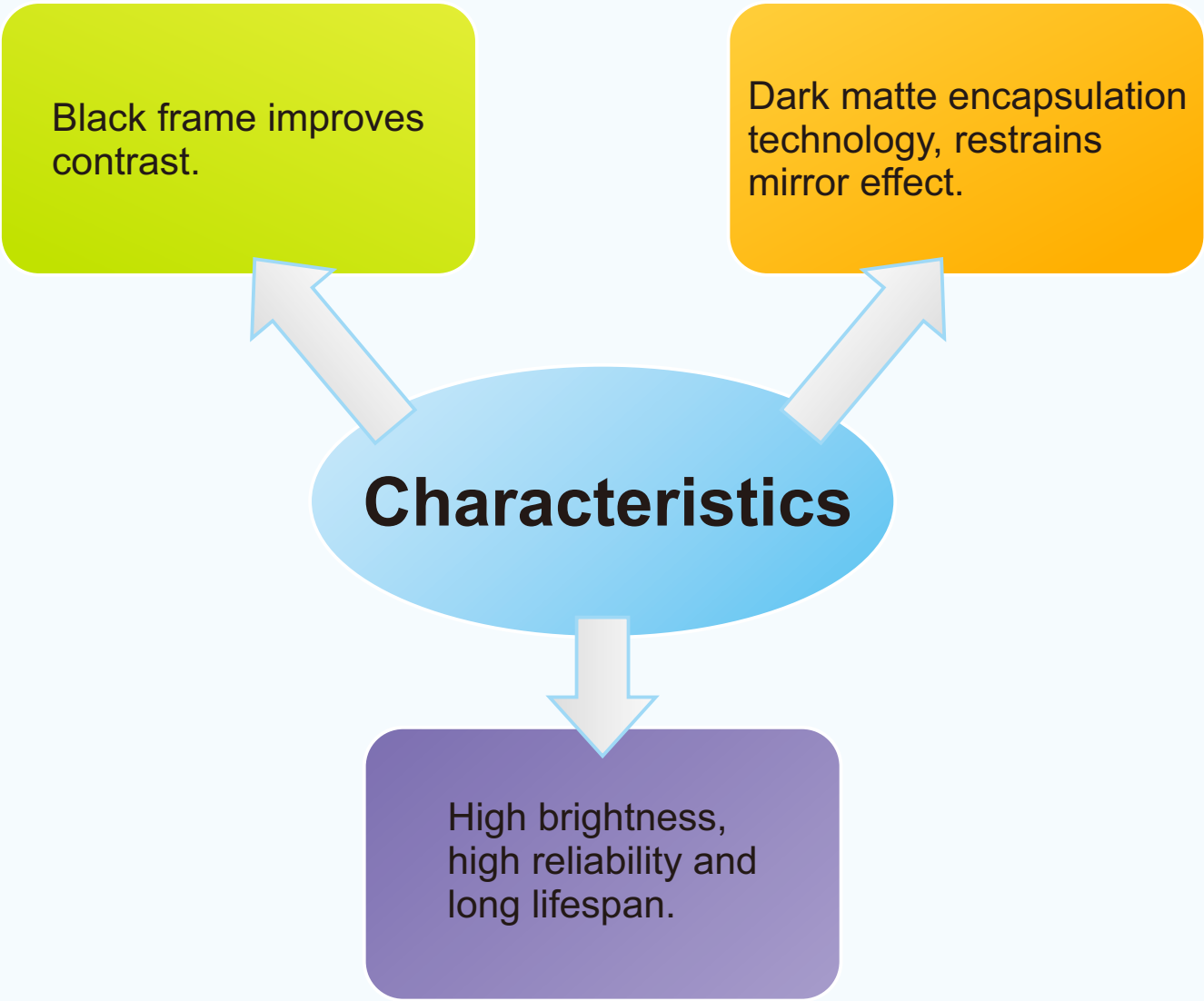


Small Pixel Pitch RGB LED Introduction

Product Name	FC-B0808RGBT-HF			FC-B1010RGBT-HG			FM-B1515RGBA-HG		
Picture									
Color									
IF(mA) TEST	5	2	2	8	5	3	8	5	3
λD(nm) Typ.	620	530	470	620	525	470	620	520	470
IV (mcd) Typ.	25	45	8	40	80	10	55	200	25
VF (V) Typ.	1.9	2.5	2.6	2.0	2.6	2.7	2.0	3.0	3.0
View angle (deg.)	120	120	120	120	120	120	110	110	110
Dimensions (mm)	 Recommended soldering pad tolerance : ± 0.2mm			 Recommended soldering pad tolerance : ± 0.2mm			 Recommended soldering pad tolerance : ± 0.2mm		

Indoor Application RGB LED Introduction

There are 4 different series of indoor application RGB LED, B2020, B2724, B3528 and 3528 LED. These products have advantages of good heat dissipation, high reliability and long lifespan.

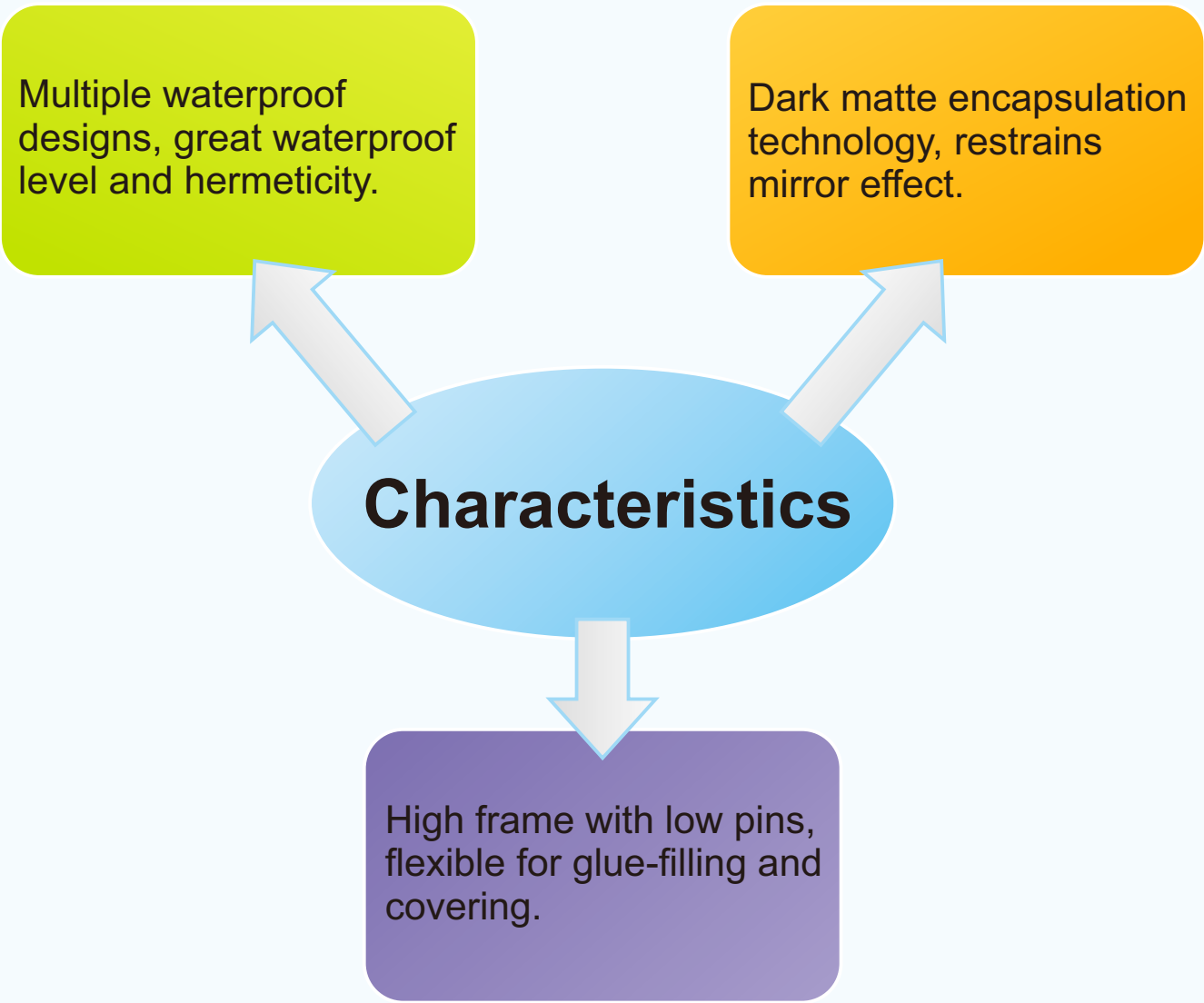


Indoor Application RGB LED Introduction

Product Name	FM-B2020RGBA-HG			FM-B3528RGBA-HG-Z			FM-3528RGBK-HG		
Picture									
Color									
I _F (mA) TEST	8	5	3	20	12	12	20	12	12
λ _D (nm) Typ.	622	526	471	620	520	470	620	520	470
I _V (mcd) Typ.	50	170	23	150	490	100	340	1000	240
V _F (V) Typ.	2.0	3.0	3.0	2.0	3.0	3.0	2.0	3.0	3.0
View angle (deg.)	110	110	110	110	110	110	110	110	110
Dimensions (mm)	 Recommended soldering pad tolerance : ± 0.2mm			 Recommended soldering pad tolerance : ± 0.2mm			 Recommended soldering pad tolerance : ± 0.2mm		

Outdoor Application RGB LED Introduction

There are 3 different series of outdoor application RGB LED, 2727, 3535 and 5050 LED. These products with high reliability, waterproof, dust proof and UV proof also.



Outdoor Application RGB LED Introduction

Product Name	FM-Z2727RGBA-SH			FM-Z3535RGBW-SH			FM-Z3535RGBA-WQ		
Picture									
Color									
IF(mA) TEST	15	8	5	15	8	5	20	20	20
λD(nm) Typ.	622	525	470	620	525	470	620	523	470
IV (mcd) Typ.	470	700	100	450	820	130	830	1750	430
VF (V) Typ.	2.0	3.0	3.0	2.0	3.0	3.0	2.0	3.0	3.0
View angle (deg.)	110	110	110	110	110	110	110	110	110
Dimensions (mm)									
	Recommended soldering pad tolerance : ± 0.2mm			Recommended soldering pad tolerance : ± 0.2mm			Recommended soldering pad tolerance : ± 0.2mm		

Small Pixel Pitch LED Display Applications



China Life Insurance's Meeting Room



2014 Tianjing Davos World Economic Forum

Indoor Display Applications



Expo 2010 Shanghai China



2013 Miss Universe Thailand



Hubei Expressway Emergency Command Center



Auto Guangzhou

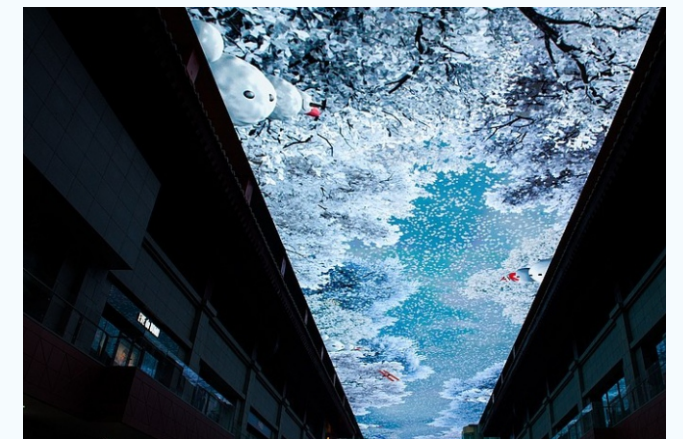
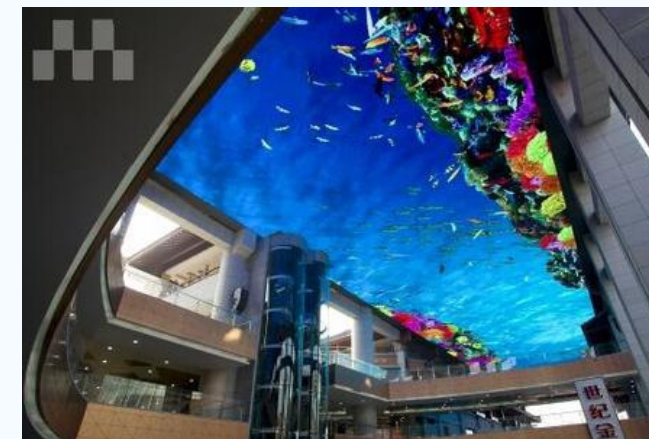
Outdoor Display Applications



2014 Brazil World Cup



Pope's Trip to Korea, August 2014



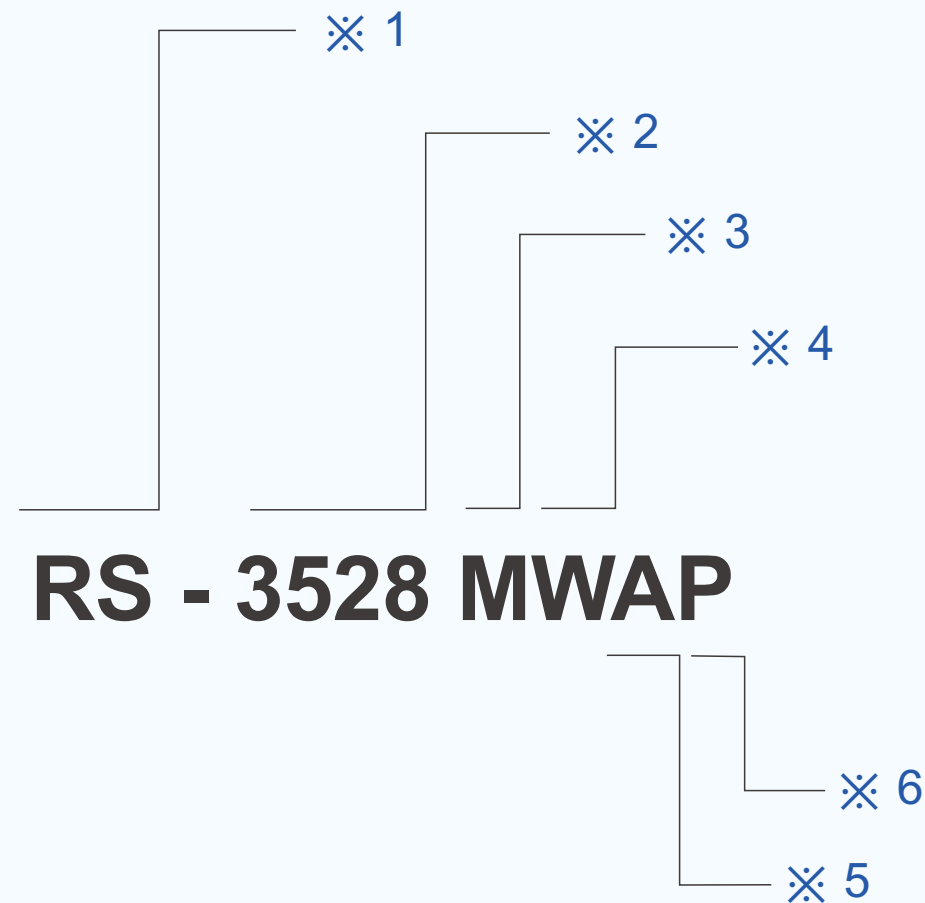
Xi'an Qin Han Tang International Cultural and Commercial Plaza Atrium



Toyota Center of the Houston Rockets

Appendix

ReeStar™ product code scheme:



1. Shorted for ReeStar
2. Outline dimensions
3. Emitting color, M-full color, R-red, G-green
4. Frame color, W-white, B-black, Z- black frame with white reflector
5. Encapsulation technique
6. Brightness level

NationStar Honors

We cherish every honor, which is the witness of our efforts and success, and the source of momentum. The honors come from the dedications and endeavors of all the NationStar staff.



Member of Semiconductor Lighting Technology
Standard Working Group



The Most Influential Enterprises
In LED Lighting Industry



Nation High-tech Enterprise



Enterprise With AAA Grade Credibility



The Key Enterprise of Emerging Industries
of Strategic Importance In Guangdong Province



Major High-tech Enterprise
of National Torch Program