



TECHNICAL EXCHANGE

北京易美新创科技有限公司
南昌易美光电科技有限公司

Shine on Colorful life

SUCCESS

SUCCESS

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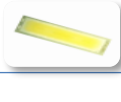


BLU PKG Information

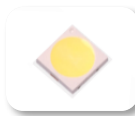
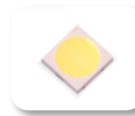
PART 1



PKG Line up for Edge-lit BLU

Series	View	Size (mm)	If (Typ)	Power	Chip#	Flux (Typ)	Status	CCT	Application
4014		4.0x1.4x0.65T	60mA	0.2W	1	23lm	MP	0.29, 0.265	MNT
			120mA	0.4W	1	45lm	MP	0.265, 0.24	TV
8520		8.5x2.0x0.7T	100mA	0.3W	1	38lm	MP	0.290, 0.265	MNT
		8.5x2.0x0.65T	120mA	0.4W	2P	43lm	MP	0.28, 0.258	MNT
7020		7.0x2.0x0.7T	120mA	0.4W	1	50lm	MP	0.295, 0.275	MNT
			120mA	0.8W	2S	80lm	MP	0.28, 0.25	TV
4014EMC		4.0x1.4x0.6T	120mA	0.8W	2S	73lm	MP	0.265, 0.24	TV
4010S		4.0x1.4x0.7T	60mA	0.2W	1	21	MP	0.29, 0.265	MNT
			120mA	0.4W	1	TBD		0.285, 0.265	TV
7020S		7.0x2.0x0.7T	120mA	0.8W	2S	77lm	Pilot	0.29, 0.265	TV

PKG Line up for Direct-lit BLU

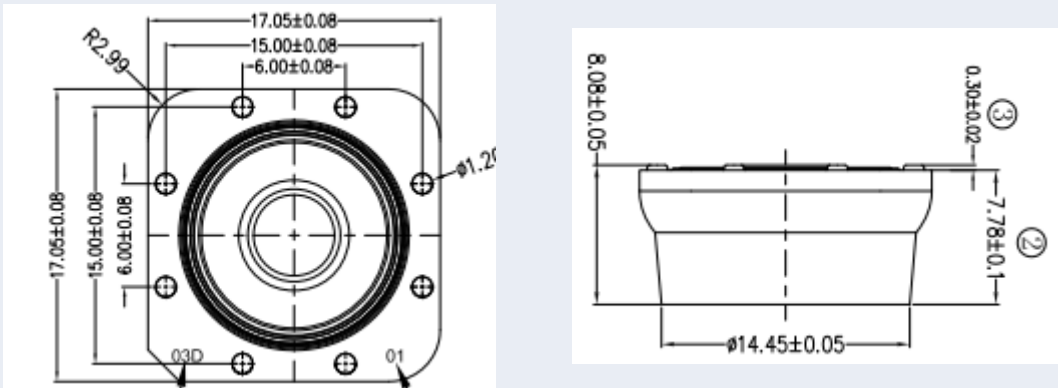
Series	View	Size (mm)	If (Max)	Power	Chip#	Flux (Typ)	Status	CCT	Application
2835PCT		2.8x3.5x0.8T	400mA	1.2-1.5W	2P	140lm	MP	0.285,0.260	OD25
3030-2.6 EMC		3.0x3.0x0.52T & 3.0x3.0x0.6T	600mA	2.0W	2P	205lm	MP	0.28,0.25	OD25
			300mA	2.0W	2S	216lm	MP	0.285,0.260	
3030-2.1 EMC		3.0x3.0x0.55T & 3.0x3.0x0.6T	600mA	2.0W	2P	180lm	MP	0.28,0.25	OD20
			300mA	2.0W	2S	197lm	MP	0.285,0.26	
3030SMC		3.0x3.0x0.55T	900mA	3W	2P	260lm	Pilot	0.285,0.26	OD15
NCSP1313		1.3x1.3x0.7T	20mA	0.06W	1	6lm	Pilot	0.282,0.267	OD3
Dome2016		2.0x1.6x0.8	60mA	0.2W	1	NA	RD	Blue	OD5



PART 2

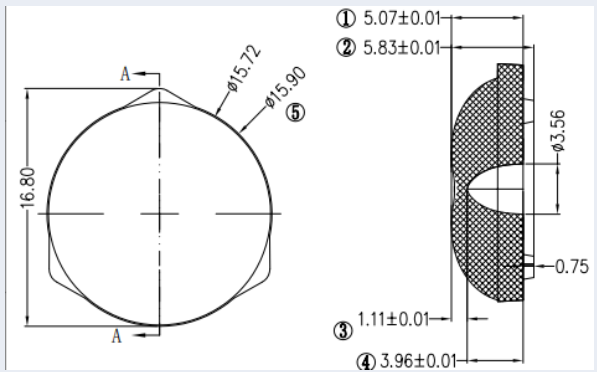
Direct-lit Solution

Optics Solution Introduction – OD20

Reflective lens	
Size	55inch
OD	20
LED Bar	5 x 10
PKG	EMC 3030 ϕ 2.1
Diffuser	1.2T/40%
film	2B1D
X pitch	110mm
Y pitch	120mm
LENS	L*W*H: 17.05*17.05*7.78mm
	 The technical drawing consists of two views: a top view (left) and a side view (right). The top view shows a square lens with a central circular lens element. Dimensions include an outer square of 17.05±0.08mm, an inner square of 15.00±0.08mm, and a central circular area with a diameter of 14.45±0.05mm. A fillet radius R2.99 is indicated at the corners. The side view shows the lens profile with a total height of 7.78±0.1mm, a top thickness of 0.30±0.02mm, and a base diameter of 14.45±0.05mm. Various mounting holes are marked with symbols like 01, 03D, and 01.25.

The OD20 reflective lens solution is in sample test and passed on 55 inch.

Optics Solution Introduction – OD20

Diffusion lens	
Size	65"
OD	OD20
LED Bar	16*10
PKG	EMC 3030 $\phi 2.1$
Diffuser	1.5T/50%
film	green film+2B1D
X pitch	69.7mm
Y pitch	70mm
LENS	$\phi * H$: 15.9*5.82mm
	 The technical drawing shows a circular diffusion lens. The top view is a circle with a diameter of 16.80 mm. The side view shows a lens with a central thickness of 0.75 mm and a total height of 5.82 mm. The lens is divided into two main sections: a top section with a height of 5.07 mm and a bottom section with a height of 5.83 mm. The lens is labeled with dimensions ① 5.07±0.01, ② 5.83±0.01, ③ 1.11±0.01, and ④ 3.96±0.01. The lens is also labeled with diameters $\phi 15.72$ and $\phi 15.90$.

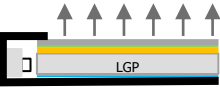
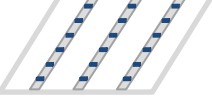
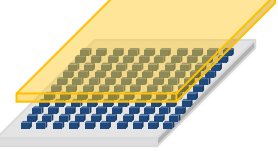
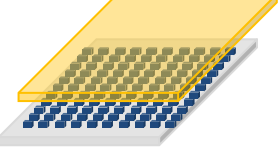
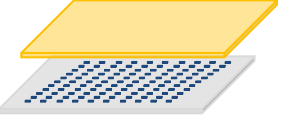
The OD20 diffusion lens solution is in sample test and passed on the 65 inch.



PART 3

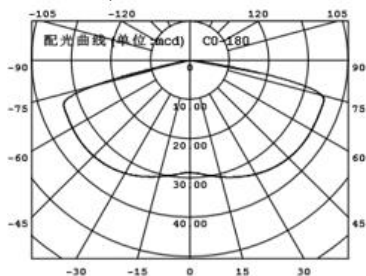
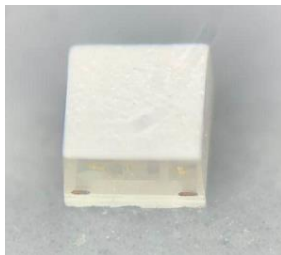
MINI-LED BLU Introduction

Normal BLU vs. Mini-LED BLU

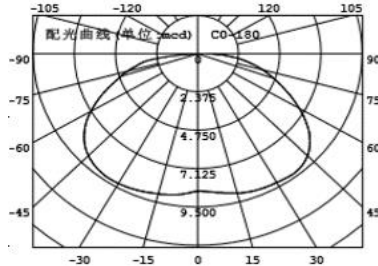
BLU Type	Edge lit type LCD Display	Direct lit type LCD Display	Mini LED BLU LCD Display		
			NCSP1313-W	Dome/NCSP1313-N	COB
Structure					
Thickness	OD<5mm	OD>20mm	OD = 2-5mm	OD = 3-12mm	OD = 0-3mm
Power	Normal	Normal	Normal	Normal	Normal
Peak Nits	Normal	Middle	Middle	High	High
Advantages	• Normal Cost • Good optical performance	• Low cost	• Better optical performance • Local dimming • Mature process • Easy for mass production • Low overall cost	• Good optical performance • Local dimming • Mature process • Easy for mass production	• Better optical performance • Local dimming • Ultra-thin • Potential price reduction • No reflector needed for OD0-1
Disadvantages	• Bad local dimming performance	• Very thick	• Relatively expensive • Difficult to handle OD<1 • High power power consumption	• Relatively expensive • Difficult to handle OD<3	• Expensive PCB • Need silicone coating • Poor consistency

MINI-LED BLU Solution – LED Package

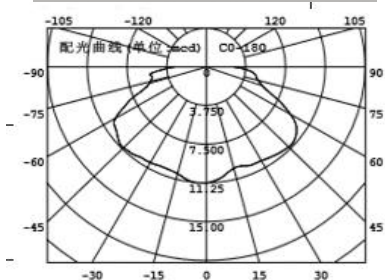
NCSP1313-W



NCSP1313-N



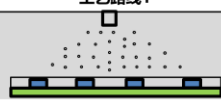
Dome2016



Device	NCSP1313-W	NCSP1313-N	Dome2016
1/2θ(degree)	165-170	145-150	145-150
Brightness	100%	140%	145%
Device	NCSP1313-A	NCSP1313-B	凸杯2016

MINI-LED BLU Solution – COB (Chip on Board)

- When OD approaches 3mm or smaller, SMD or NCSP no longer feasible due to package's own height limitation
- Directly putting flip chip LED on PCB or Glass becomes necessary
- Need encapsulation to protect the chip or putting lens to widen beam angle

项目	工艺路线1	工艺路线2
封装		
扩散板	丝印处理	不处理
芯片尺寸	0620	0620
支撑柱	no	yes
主观均匀性	Ok	Ok
主观摩尔纹	不易发生(不易变形)	易发生
可靠性	好	好
加工成本	低	高
加工效率	高	低
维修成本(封胶后)	高	低
良率	高	低(单点重复进行, 一致性存在风险)
工艺复杂度	简单	复杂
组装	方便	需特别注意破坏LENS和Support Pin
抗板材形变	强	弱
综合成本	中	中高





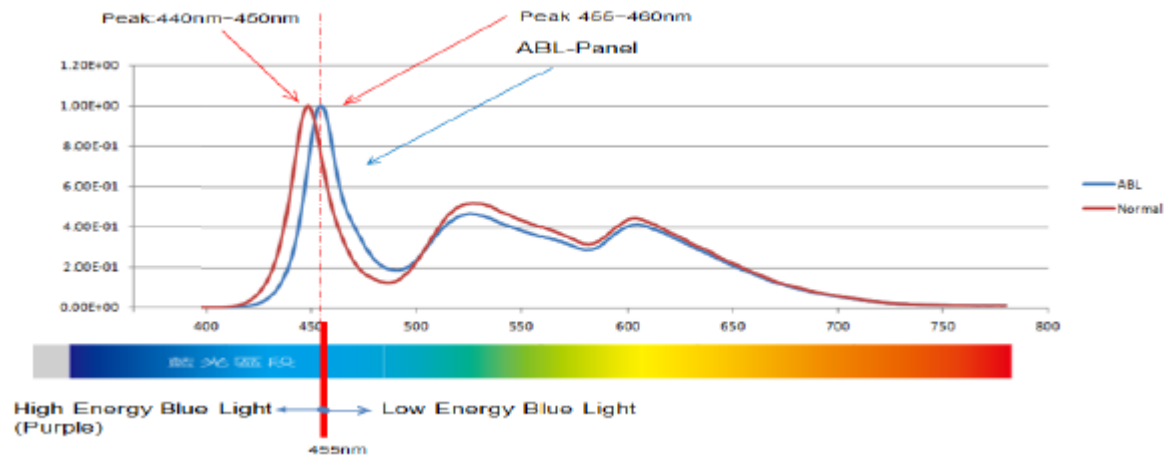
PART 4

New Technology In BLU Application

Low Blue light solution

More and more medical and scientific research has clearly demonstrated that the blue radiation from the excessive use of electronic display products will have an impact on human health.

TUV Requirement: The ratio of light in the range from 415nm- 455nm compared to 400nm- 500nm shall be less than 50%.

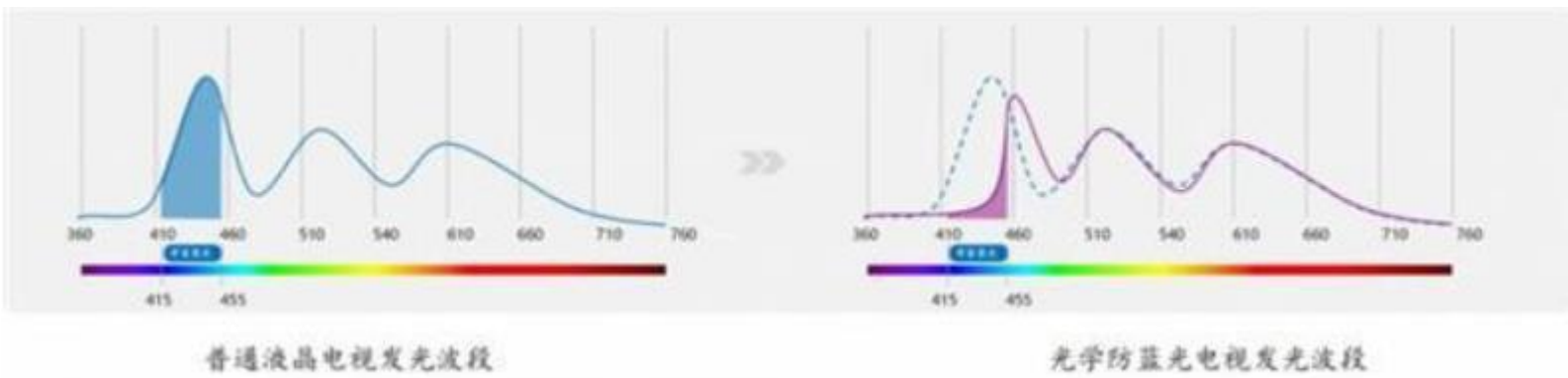


Category	Blue Light Ratio (415-455/400-500nm)
1	$\leq 20\%$
2	$20\% < R \leq 35\%$
3	$35\% < R \leq 50\%$
Failed	$> 50\%$

Low Blue light solution

Solution:

Adjust the wavelength of the chip to 460nm ,and optimize phosphor scheme, reduce the harmful blue light energy



Projects in customer

Item	Cus.	Status	PKG Type	Chip	Wd (nm)	LCM Brightne ss	LCM CIE		NTSC %	TUV
							x	y		
23.8 MNT	X	DVT	4014	2240	≥457.5	250	0.313	0.329	≥72	35~50%
27 MNT		DVT				250	0.313	0.329	≥72	35~50%
50Q5 TV	S	MP	2235	400		0.28	0.29	≥72	35~50%	
49Q6 TV		MP	3030	2235 2P		350	0.28	0.29	≥72	35~50%
43Q6 TV		MP				400	0.28	0.29	≥72	35~50%

Thank you