



PC30N22 V0 Preliminary
Product Specification

Approval Sheet

PC30N22

Product Specification



Product	White SMD LED
Part Number	PC30N22 V0
Issue Date	2017/06/30

■ Features

- ✓ White SMD LED (L x W x H) of 3.0 x 1.4 x 0.6 mm
- ✓ AEC-Q101 Rev. D and IEC 60810 qualification
- ✓ Dice Technology : InGaN
- ✓ Qualified according to JEDEC moisture sensitivity Level 3
- ✓ Environmental friendly ; RoHS compliance
- ✓ ESD protection
- ✓ Packing : 3,000 / 1,000 / 500 pcs/reel

■ Applications

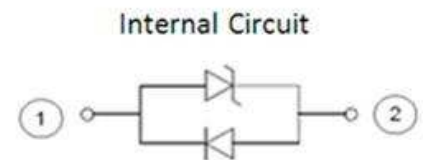
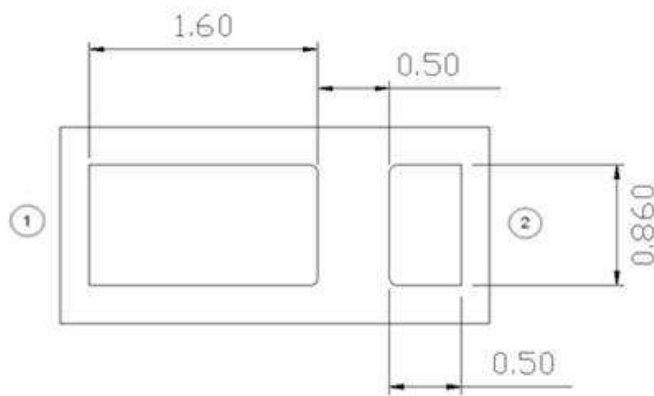
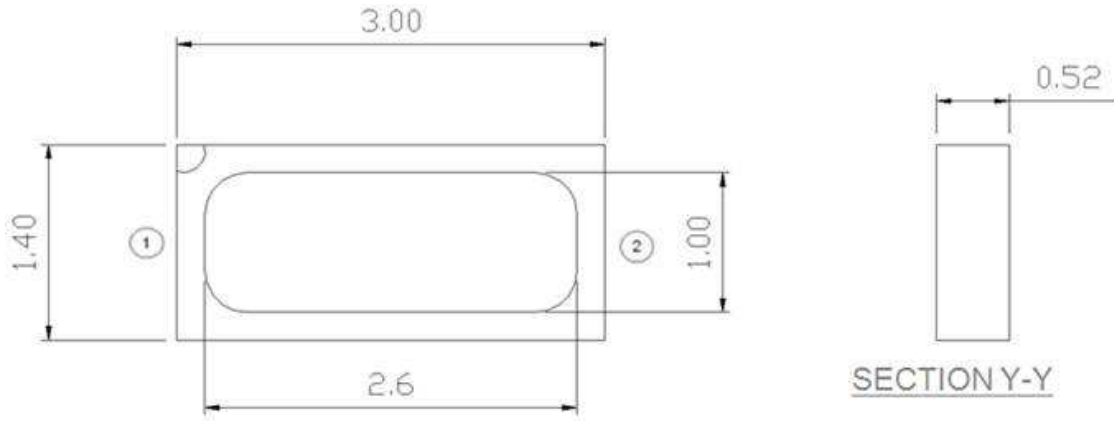
- ✓ Automotive backlight
- ✓ General displays

Outline Dimension

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Package Dimension



Unit: mm, Tolerance: $\pm 0.1\text{mm}$

Performance

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■ Electro-Optical Characteristics (Ta=25°C)

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Forward Voltage	V _F	I _F =80 mA	2.7	3.1	3.4	V
		I _F =10μA	2.2	-	-	V
Luminous Flux	Φ _v	I _F =80 mA	22.5	28	34.5	lm
View Angle	2θ _{1/2}	I _F =80 mA	-	120	-	degree
Chromaticity Coordinate *	x	I _F =80 mA	Refer to ranking table			
	y	I _F =80 mA				

* Please refer to CIE chromaticity diagram

■ Absolute Maximum Ratings

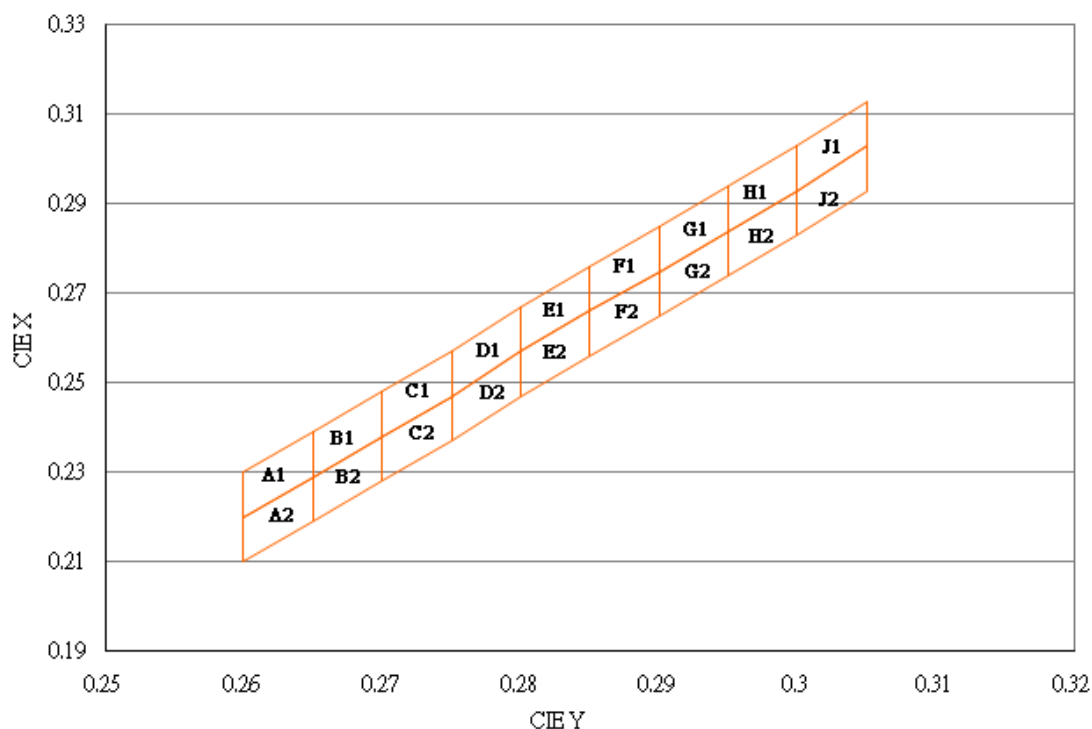
Item	Symbol	Absolute Maximum Rating	Unit
Forward Current	I _F	150	mA
Pulse Forward Current ⁽¹⁾	I _{FP}	300	mA
Power Dissipation	P _D	500	mW
Electrostatic Discharge	ESD	6000	V
Operating Temperature	T _{opr}	-40 ~ +100	°C
Storage Temperature	T _{stg}	-40 ~ +100	°C
Soldering Temperature	T _{sld}	Reflow Soldering : 245 (10sec)	°C
		Hand Soldering : 350 (3sec)	
Dice Temperature	T _j	120	°C

(1) IFP Condition: t < 10 μs ; D = 0.005 ; T_s = 25 °C

Binning

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*Color Coordinates Measurement allowance is ± 0.005 .

Forward Voltage Rank

V _F Rank	Condition	Min.	Max.	Unit
W	I _F = 80 mA T _j =25°C	2.7	2.8	V
L		2.8	3.0	
M		3.0	3.2	
N		3.2	3.4	

* The Forward Voltage tolerance is $\pm 0.05V$.

Luminous Intensity Ranks

Luminous Flux Rank	Condition	Min.	Max.	Unit
Z	I _F = 80 mA T _j =25°C	22.5	24.5	lm
1		24.5	26.5	
2		26.5	28.5	
3		28.5	30.5	
4		30.5	32.5	
5		32.5	34.5	

* Luminous Intensity Measurement allowance is $\pm 7\%$

■ **Chip Dominant Wavelength Groups**

Wd Rank	Min.	Max.	Unit
2	447.5	450	nm
3	450	452.5	
4	452.5	455	

■ **Bin code definition**

V _F Rank	Luminous Flux Rank	Wd Rank	CIE Rank
L	2	3	E1

■ **CIE Rank**

(Ta=25°C)

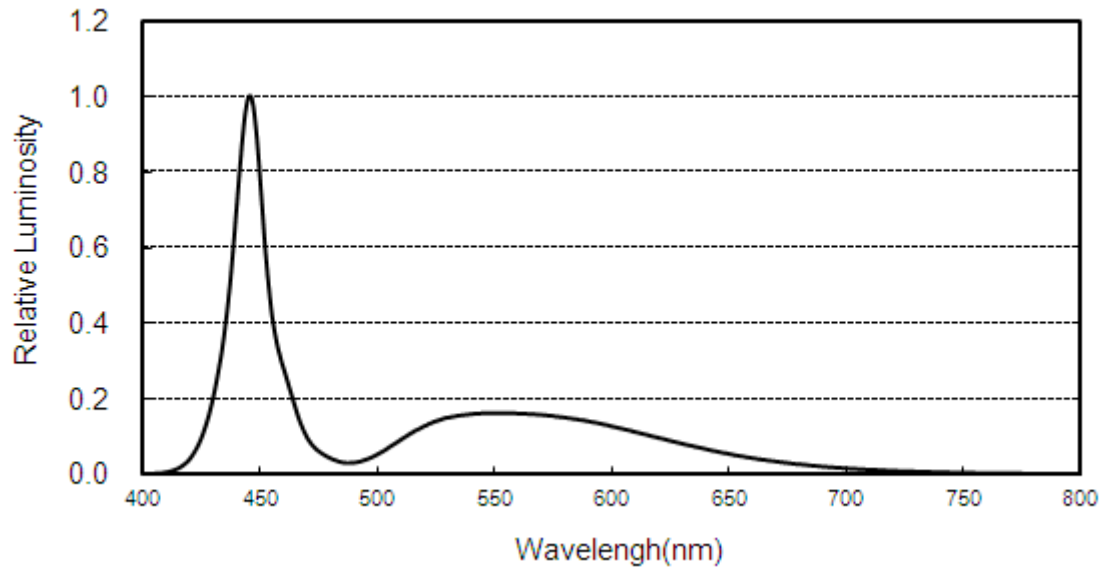
A1		B1		C1		D1		E1	
x	y	x	y	x	y	x	y	x	y
0.260	0.220	0.265	0.229	0.270	0.238	0.275	0.247	0.280	0.257
0.260	0.230	0.265	0.239	0.270	0.248	0.275	0.257	0.280	0.267
0.265	0.239	0.270	0.248	0.275	0.257	0.280	0.267	0.285	0.276
0.265	0.229	0.270	0.238	0.275	0.247	0.280	0.257	0.285	0.266
F1		G1		H1		J1			
x	y	x	y	x	y	x	y		
0.285	0.266	0.290	0.275	0.295	0.284	0.300	0.293		
0.285	0.276	0.290	0.285	0.295	0.294	0.300	0.303		
0.290	0.285	0.295	0.294	0.300	0.303	0.305	0.313		
0.290	0.275	0.295	0.284	0.300	0.293	0.305	0.303		
A2		B2		C2		D2		E2	
x	y	x	y	x	y	x	y	x	y
0.260	0.210	0.265	0.219	0.270	0.228	0.275	0.237	0.280	0.247
0.260	0.220	0.265	0.229	0.270	0.238	0.275	0.247	0.280	0.257
0.265	0.229	0.270	0.238	0.275	0.247	0.280	0.257	0.285	0.266
0.265	0.219	0.270	0.228	0.275	0.237	0.280	0.247	0.285	0.256
F2		G2		H2		J2			
x	y	x	y	x	y	x	y		
0.285	0.256	0.290	0.265	0.295	0.274	0.300	0.283		
0.285	0.266	0.290	0.275	0.295	0.284	0.300	0.293		
0.290	0.275	0.295	0.284	0.300	0.293	0.305	0.303		
0.290	0.265	0.295	0.274	0.300	0.283	0.305	0.293		

Characteristics

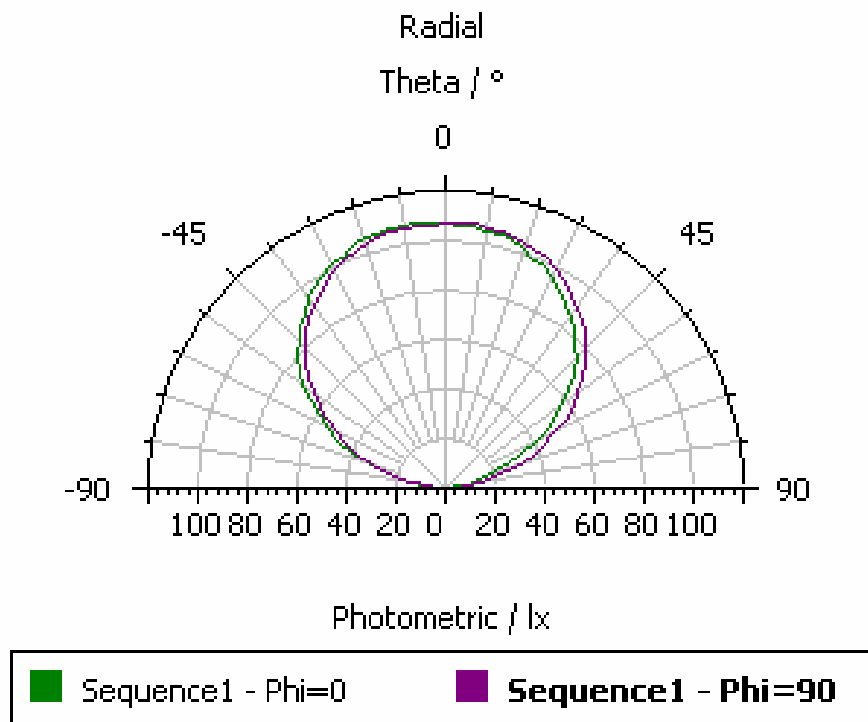
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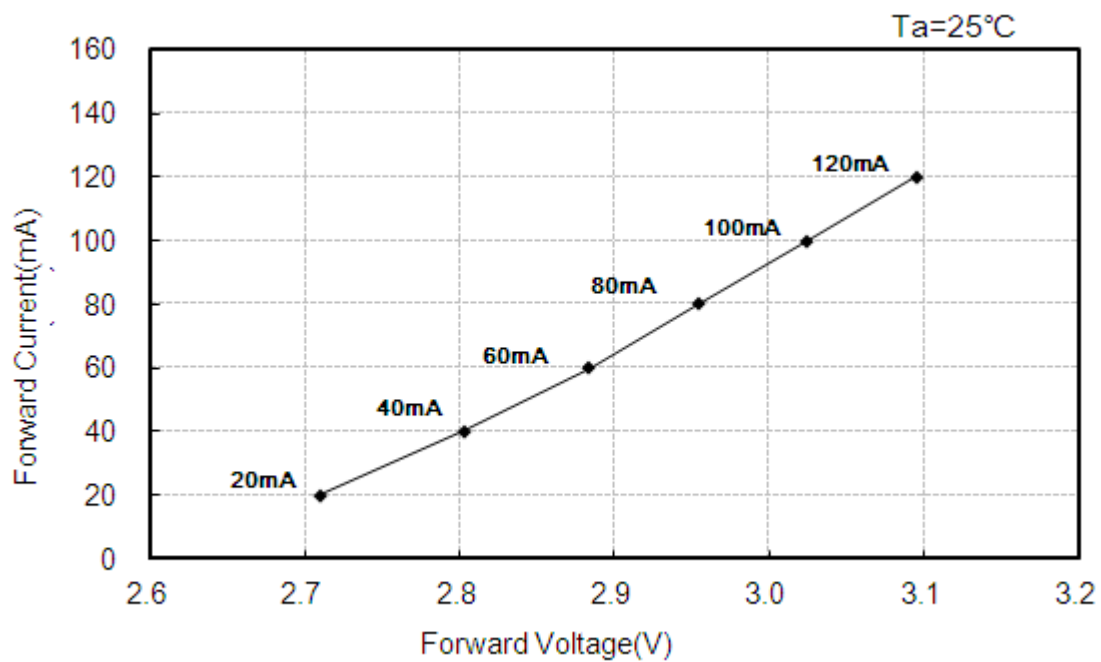
Spectrum



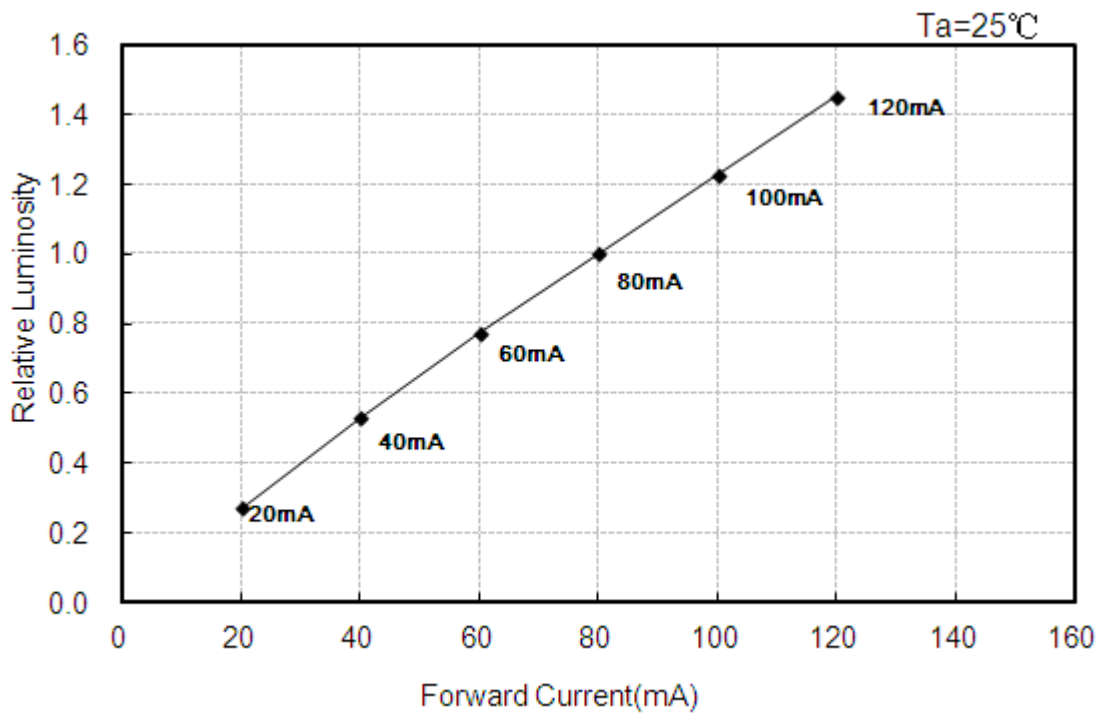
Radiation Pattern



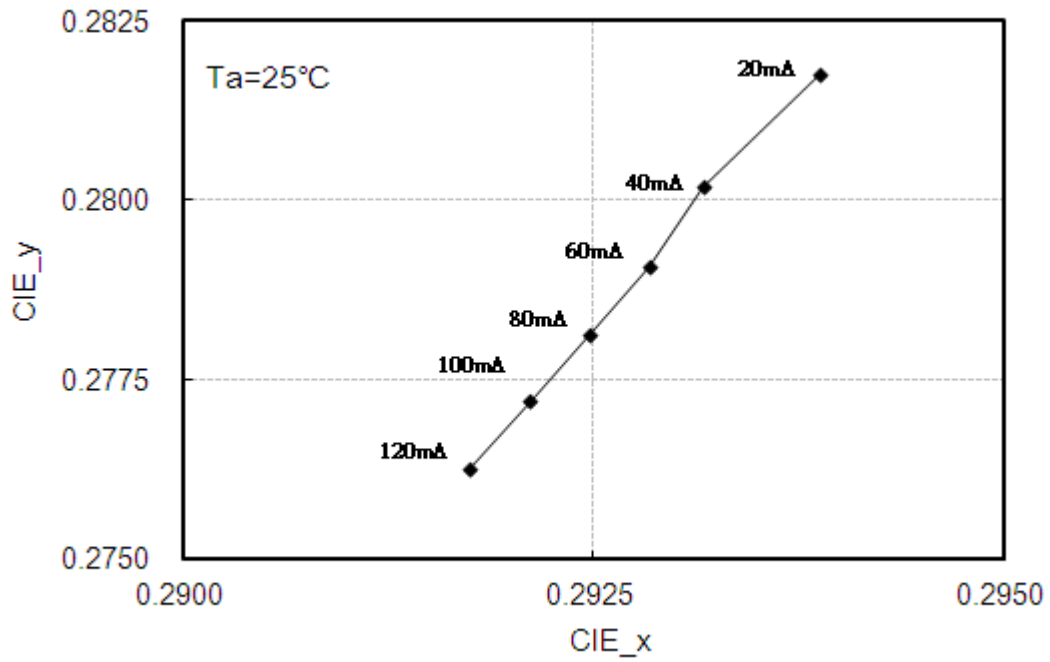
■ Forward Voltage vs. Forward Current



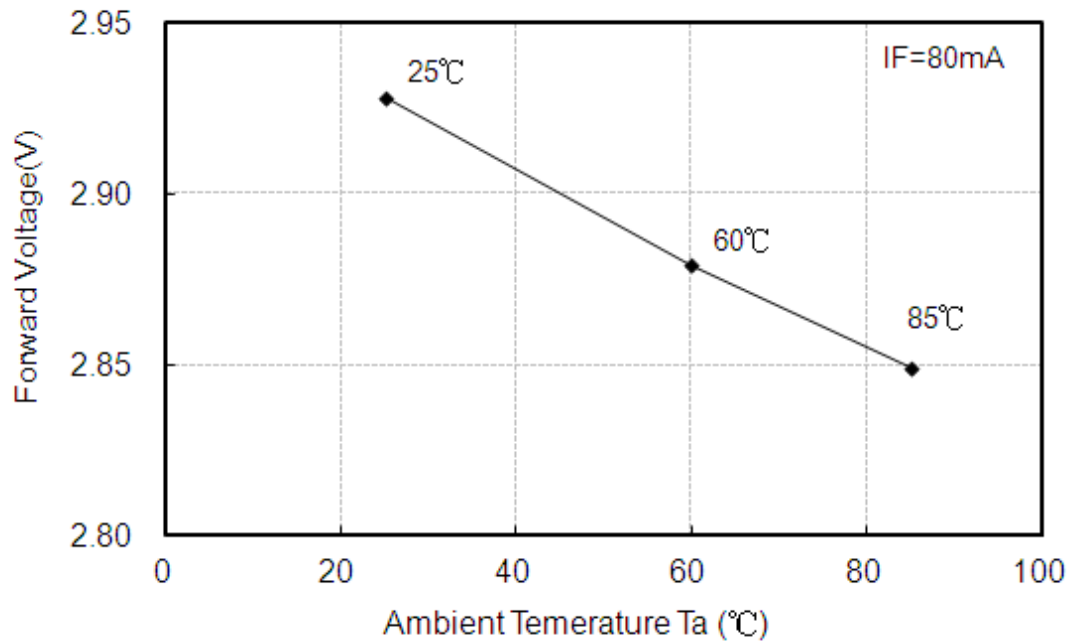
■ Forward Current vs. Relative Luminosity



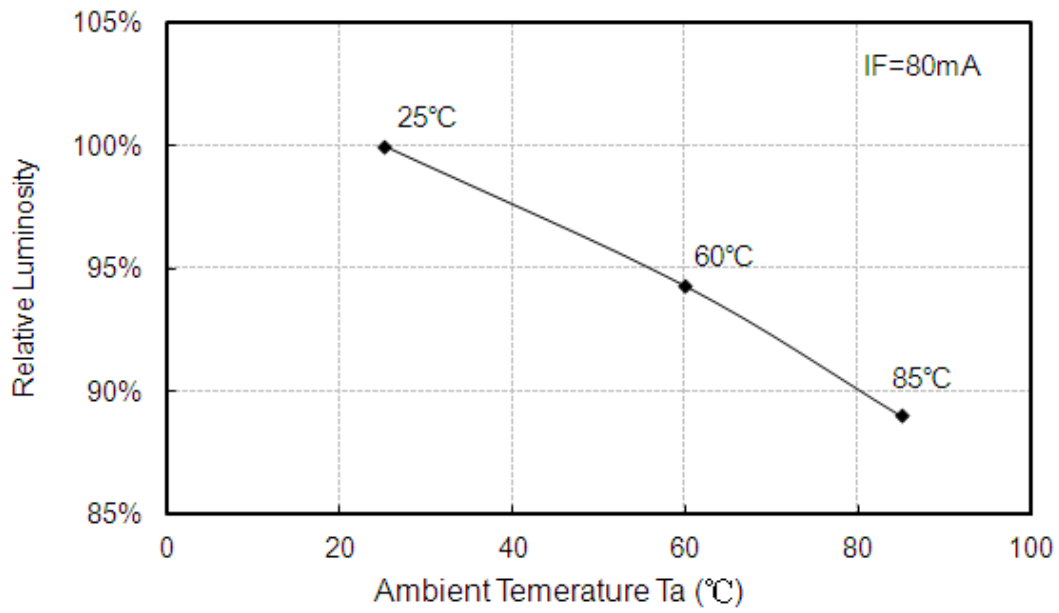
■ **Forward Current vs. Chromaticity Coordinate**



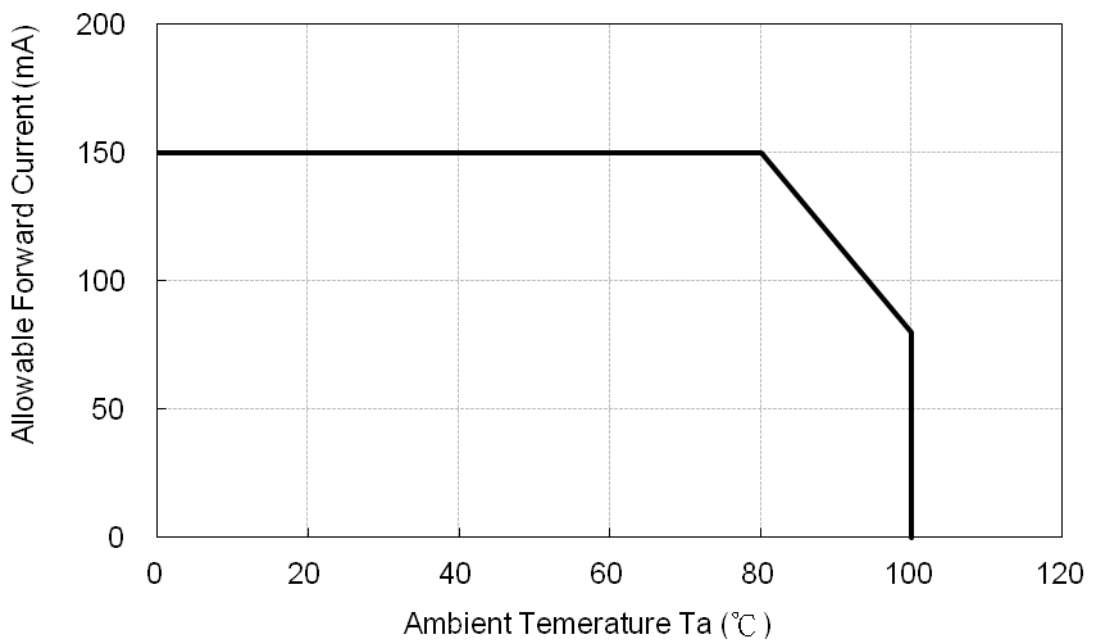
■ **Relative Forward Voltage vs. Ambient Temperature**



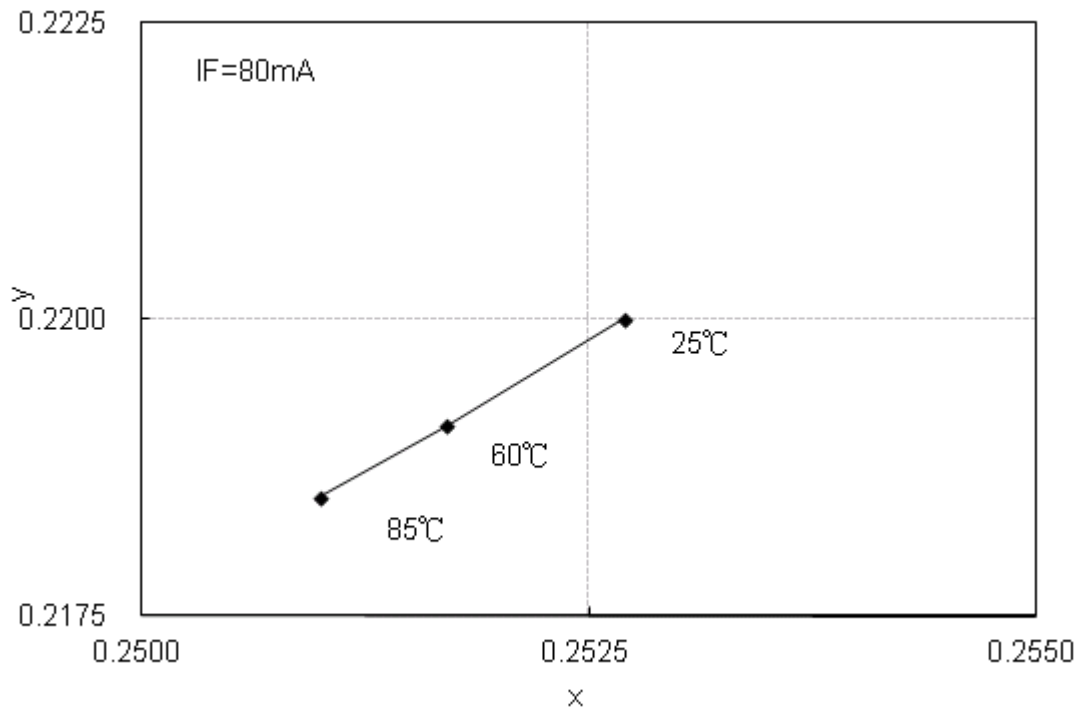
■ **Relative Luminous Intensity vs. Ambient Temperature**



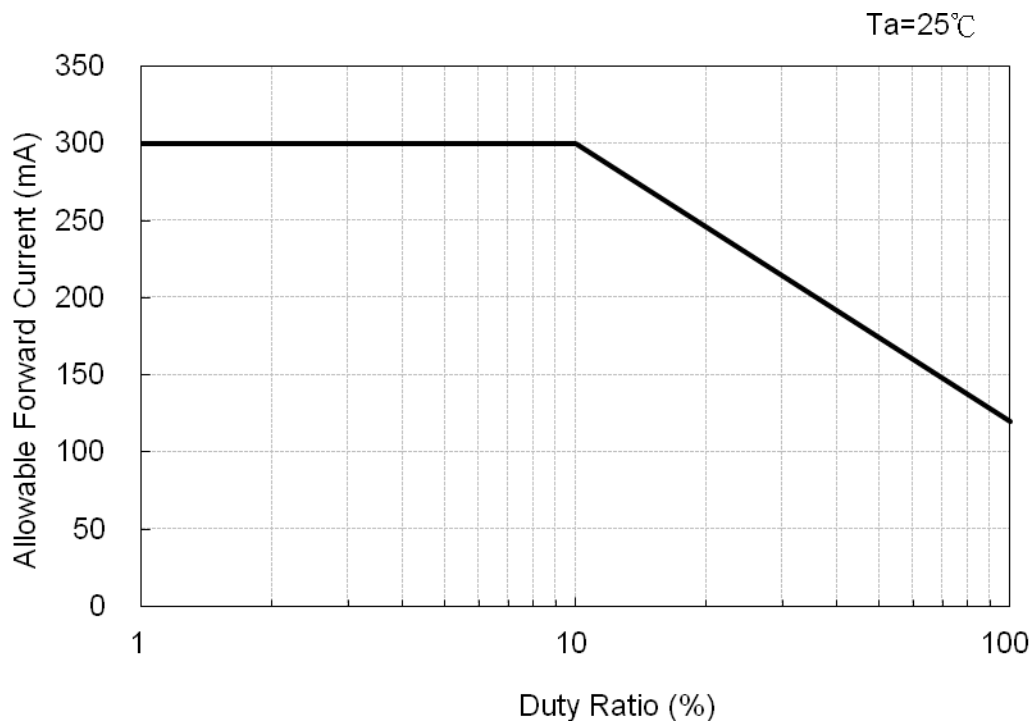
■ **Allowable Forward Current vs. Ambient Temperature**



■ Chromaticity vs. Ambient Temperature



■ Allowable Forward Current vs. Duty ratio



Reliability

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Reliability test

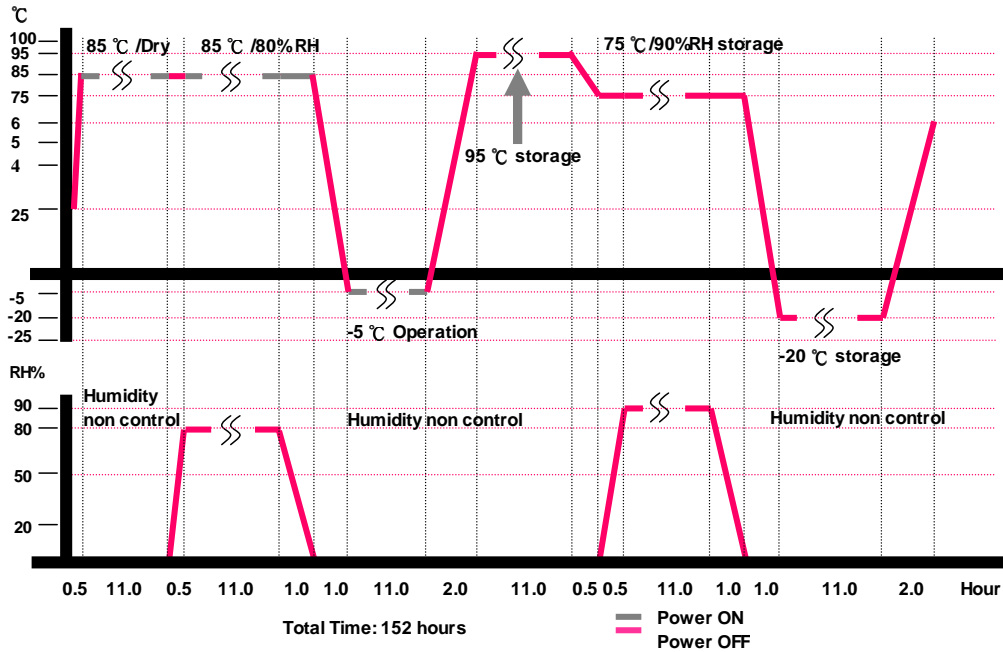
No	Items[1]	Temperature	Humidity	Other condition (30 pcs)	Hrs	Times	Applicable standard	Criteria for judgment	
		(°C)	(%)					LED Brightness @ 120mA	Vf @ 120mA
1	Temperature humidity storage	85	85	-----	1000		JEITA ED-4701 100 103	>70%	<110%
2	Steady State Operating Life of High Temperature	85	-----	IF =80mA	1000		JESD22-A1 08	>70%	<110%
3	Steady State Operating Life of High Humidity Heat	60	90	IF =80mA	1000		JEITA ED-4701 100 102	>70%	<110%
4	Steady State Operating Life of Low Temperature	-30	-----	IF =80mA	1000		JESD22-A1 19	>70%	<110%
5	On/Off testing	60	Room Humidity	IF =80mA 10secON /10secOFF 35000 circular Continue	195		LX Standard	>70%	<110%
6	Thermal Shock	-----	-----	-40°C ~ 100°C 20sec 20 min. 20 min		200 cycles	JESD22-A1 06	>70%	<110%
7	Thermal Cycle	[2]	[2]	[2]	152 hour s/2cycles	1	LX Standard	>70%	<110%
8	Resistance to Soldering Heat (Reflow Soldering)	-----	-----	(Pre- store @ 25°C, 60±5% RH for 168hrs) TSld = 245°C, 10sec.		1	JESD22-A1 13	< ±5%	< ±5%
9	Vibration	Room Temp	Room Humidity	Random, 6 Grms , 10~500Hz, for 30 min changeable vibration per circular X,Y,Z 3 directions	30 min /time	1	JESD22-B1 03	Go or not Go	

10	Life time	60	60	IF =80mA			JEITA ED-4701 100 102	>70%	<110%
11	Sulfur corrosion Test	50	75		6 hrs	1	LX Standard	< ±5%	<110%
12	ESD	Room Temp	Room Humidity		-----	-----	MIL-STD-88 3G,Method3 015.7	-----	[3]

[1] The items may be modified for different application and will be defined by product or component engineers.

※ Refer to reliability test standard specification.

[2] The thermal profile is shown below.



[3] ESD Failure criteria:

3-1 Electrical failures: $V_f (I_f = 120\text{mA}) > \text{acc. to Uf binning}; \pm 10\%$ from initial value

$V_f (I_f = 0.02\text{mA}) < 2.2\text{V}$,

$V_r (I_r = 20\text{mA}) < 0.6\text{V}; > 1.2\text{V}$

3-2 Optical failures: $I_V (I_f = 120\text{mA}) < \pm 70\%$ of initial value and $|\Delta\%_{\text{max}} - \Delta\%_{\text{min}}| > 30\%$

$\Delta X > 0.01$

$\Delta Y > 0.025$

■ **Judgment Criteria**

Item	Symbol	Test Condition	Judgment Criteria
Forward Voltage	Vf	80mA	$\Delta Vf < 10 \%$
Luminous Intensity	Iv	80mA	$\Delta Iv < 30 \%$

Item	Condition	min	typ	Max	Unit
Life time [1]	Ta=60°C, If ≤ 80mA, Tj < 95°C [2]	50000			Hrs

[1] Life time means that estimated time to 50% degradation of initial luminous intensity.

[2] Test board : 76x76x1.4 mm, MCPCB circuit board

Packing

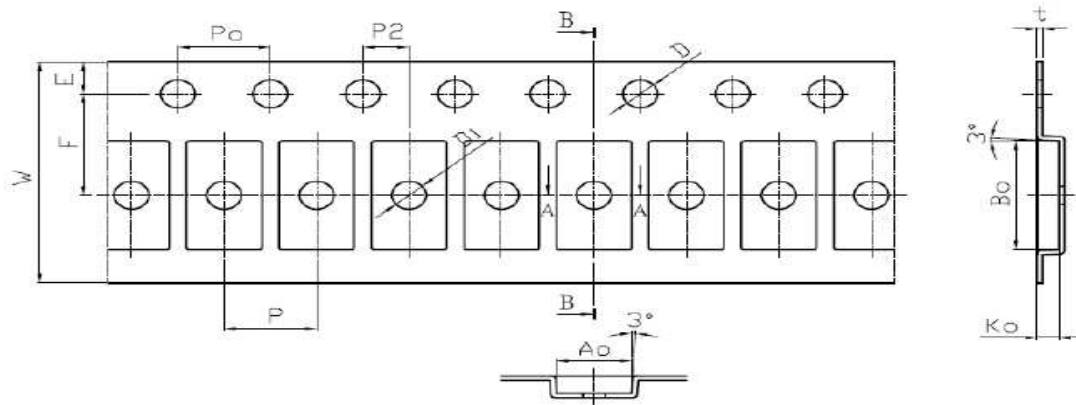
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Label



Carrier Tape Dimension



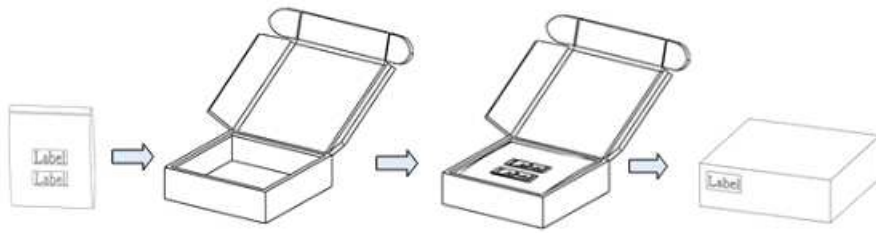
Unit: mm

Item	Spec	To1. (+/-)	Item	Spec	To1. (+/-)
W	12.00	±0.10	P2	2.00	±0.05
E	1.75	±0.10	P0 x 10	40.00	±0.20
F	5.50	±0.05	t1	0.25	±0.05
D	1.50	+0.10, -0.00	A0	1.55	±0.10
D1	1.00	±0.10	B0	4.20	±0.10
P0、P1	4.00	±0.10	K0	1.02	±0.10

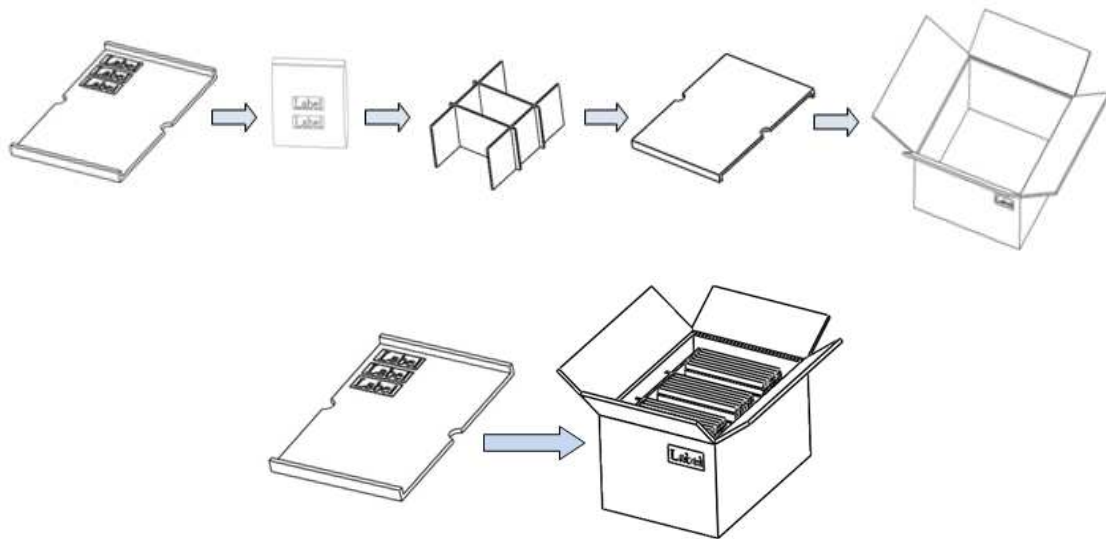
Anti-Static Package:



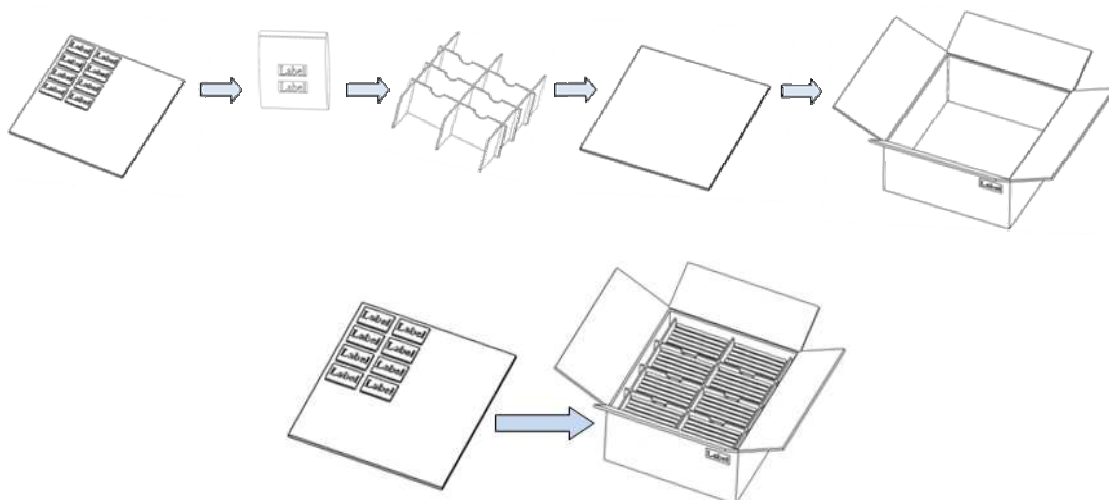
■ **Small Box**



■ **Medium Box**



■ **Large Box**



Precautions

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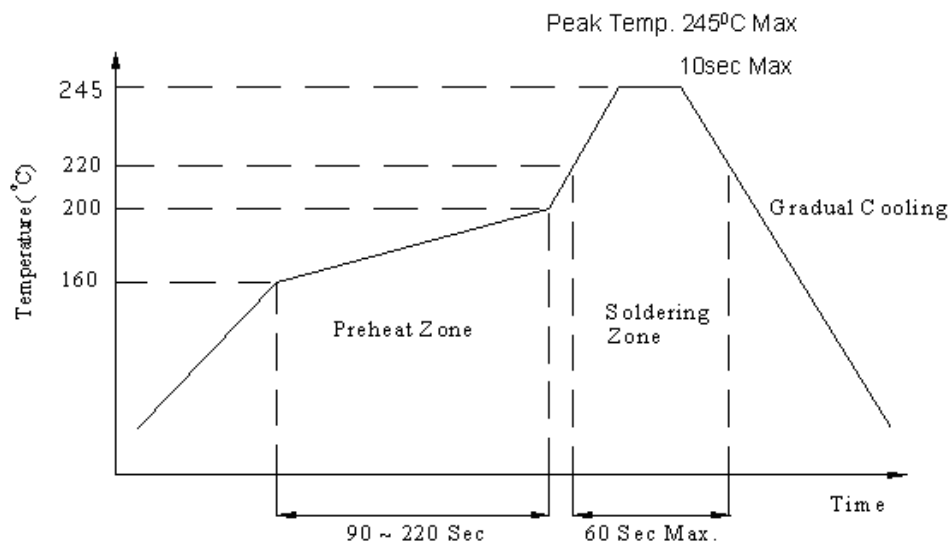
■ Safety Precautions

- The LED light output is too strong for human eyes without shield. Prevent eye contact directly more than seconds.
- Ensure operating under maximum rating.

■ Storage

- Before opening the package, the LEDs should storage under 30°C, 70% RH. Recommend to use within one year.
- After opening the package bag, the LEDs should be keep under 30°C, 70% RH. Recommend to use within 2days. If unused LEDs remain, suggest to store into moisture proof bag or original package bag with moisture absorbent material such as silica gel. Reseal well is necessary.
- If the product exceeded the storage period or the moisture absorbent material faded away, baking treatment should be done by following conditions. Baking condition: 60°C, 12hours (One time only).

■ Soldering Notice and Conditions



- When soldering, don't put stress on the LEDs
- After LEDs have been soldered, strongly recommend not to repair to keep the LEDs performance.

■ Static Electricity

- LED package is extremely sensitive to static electricity. It's recommended that anti-electrostatic glove and wrist band is necessary when handling the LEDs. All devices are also be grounded properly as well.
- Protection devices design should be considered in the LED driving circuit.

■ Cleaning

- If washing is required, recommend to use alcohol as a solvent.
- Recommend to avoid cleaning the LEDs by ultrasonic. If necessary, pre-test the LED is necessary to confirm whether any damage occur after the process.

Revision History

PC30N22

Product Specification

Date	Contents	Writer	Approved
2017.06.30	Preliminary version	Bemore Chen	Rex Chen

Smart Lighting Amazing Life

Lextar Electronics Corp. is the leading LED (Light Emitting Diode) maker integrating upper stream epitaxial, middle stream chip, and downstream package, SMT and LED lighting applications. Founded in May, 2008, Lextar is a subsidiary of AU Optronics, the leading TFT-LCD and solar PV manufacturer. Lextar's product applications include lighting and LCD backlight. Lextar's manufacturing sites include Hsinchu and Chunan in Taiwan, and Suzhou in China. The company turnover in 2010 is 266 million USD.