PRODUCT SPECIFICATION

Part Number

PLC3528A4-WCRB0801

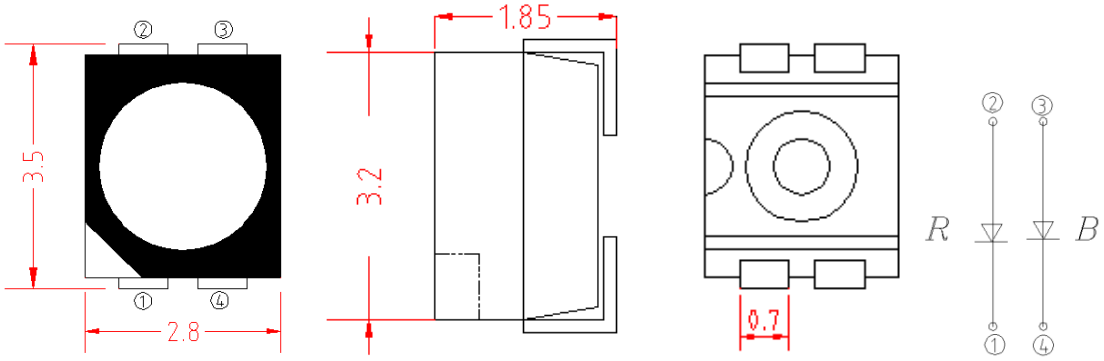
Details

- Bi-Color Surface Mount LED w/ Black Surface
- PLCC-4 3.5 x 2.8 x 1.85mm
- 2,000 piece reels
- Emitting Color: Red, Blue
- AlInGaP & InGaN chip material

Features

- Wide viewing angle 120˚
- High luminous output
- Compatible lead-free reflow soldering process
- RoHS Compliant

Mechanical Dimensions



Notes:
1. Specifications subject to change without notice
2. Tolerance of measurement of dimensions: ±0.2mm

Device Selection Guide

Model Number	Chip		Description
	Material	Emitting Color	
PLC3528A4-WCRB0801	AlInGaP	Red	Bi-Color
	InGaN	Blue	

Absolute Maximum Ratings at Ta=25℃

Parameter	Symbol		Rating	Unit
Power Dissipation	Pd	R	69	mW
		B	92	
Forward Current (DC)	IF	R	30	mA
		B	30	mA
Peak Forward Current (1)	IFP	R	100	mA
		B	100	
Reverse Voltage	VR	5		V
LED Junction Temperature (2)	Tj	115		℃
Operating Temperature	Topr	-40~+85		℃
Storage Temperature	Tstg	-40~+100		℃
Soldering Temperature	Tsol	Reflow Soldering: 260℃ for 10 sec Hand Soldering: 350℃ for 3 sec		

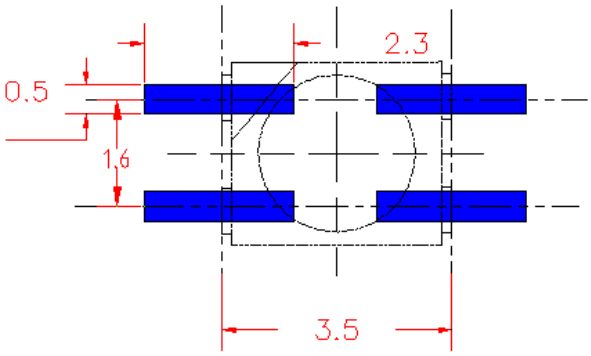
Notes: 1. Pulse width ≦ 0.1 msec, duty ≦ 1/10

2. Proper current rating must be observed to maintain junction temperature below the maximum at all the time.

Electrical and Optical Characteristics at Ta=25℃

Parameter	Symbol		Min.	Typ.	Max.	Unit	Condition
Forward Voltage	VF	R	--	2.2	--	V	IF=20mA
		B	--	3.0	--		
Luminous Intensity	Φv	R	--	560	--	mcd	
		B	--	290	--		
Peak Wavelength	λP	R	--	628	--	nm	
		B	--	463	--		
Dominant Wavelength	λD	R	--	621	--	nm	
		B	--	467	--		
Viewing Angle	2θ 1/2	--	--	120	--	deg	
Reverse Current	IR	R	--	--	10	μA	VR=5V
		B	--	--	10		

Recommended Soldering Pad Pattern



Luminous Intensity Rank Limits (IF = 20mA)

Bin Code	Red		Unit
	Min	Max	
24	380	490	mcd
25	490	640	
26	640	830	

Bin Code	Blue		Unit
	Min	Max	
21	170	220	mcd
22	220	290	
23	290	380	

Note: Tolerance of measurement of luminous intensity: ±12%

Forward Voltage Rank Limits

Bin Code	Red		Unit
	Min	Max	
V1C	1.8	2.1	V
V2A	2.1	2.4	
V2B	2.4	2.7	

Bin Code	Blue		Unit
	Min	Max	
V2B	2.4	2.7	V
V2C	2.7	3.0	
V3A	3.0	3.3	

Note: Tolerance of measurement of Forward Voltage: ±10.1V

Dominant Wavelength Rank Limits (IF = 20mA)

Bin Code	Red		Unit
	Min	Max	
A5	615	620	nm
R1	620	625	
R2	625	630	

Bin Code	Blue		Unit
	Min	Max	
B5	460	465	nm
B6	465	470	
B7	470	475	

Note: Tolerance of measurement of Dominant Wavelength: ±1nm

Typical Electrical / Optical Characteristic Curves

- *Ta = 25℃ Unless Otherwise Noted*

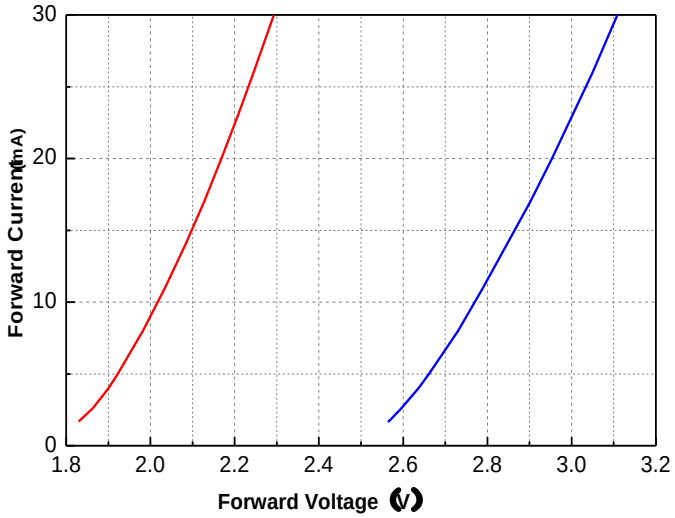


Figure1. Forward Current VS. Forward Voltage

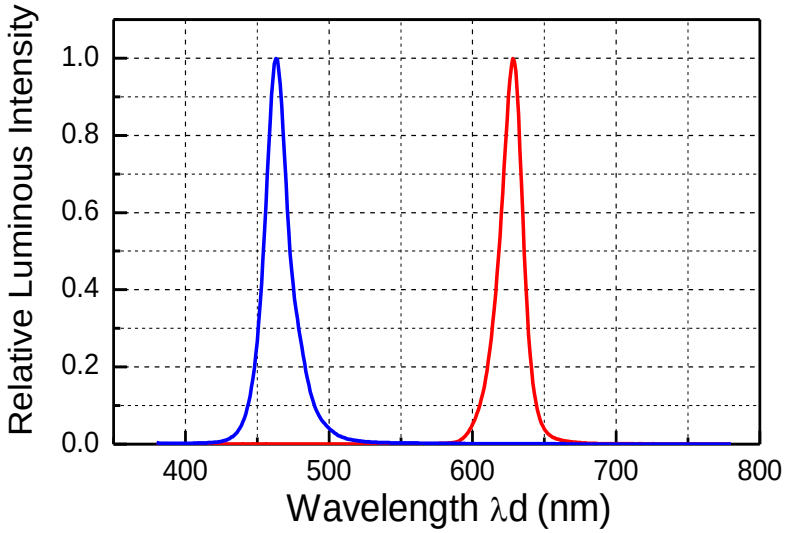


Figure2. Spectral Power Distribution vs. Wavelength

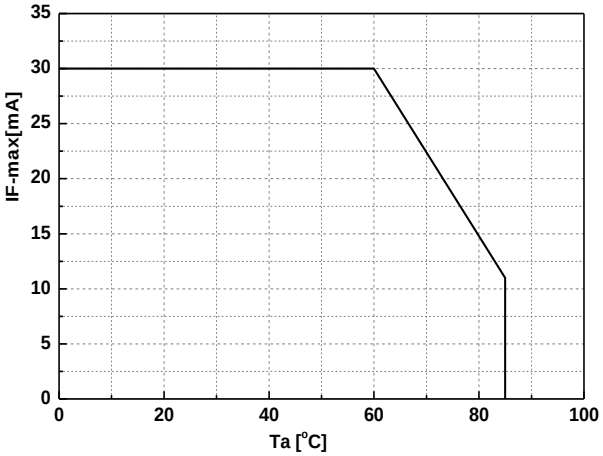


Figure3. Forward Current vs. Ambient Temperature

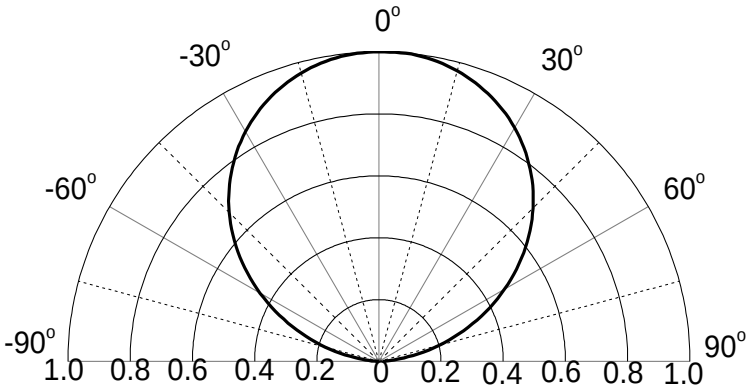


Figure4. Relative Luminosity VS. Radiation Angle

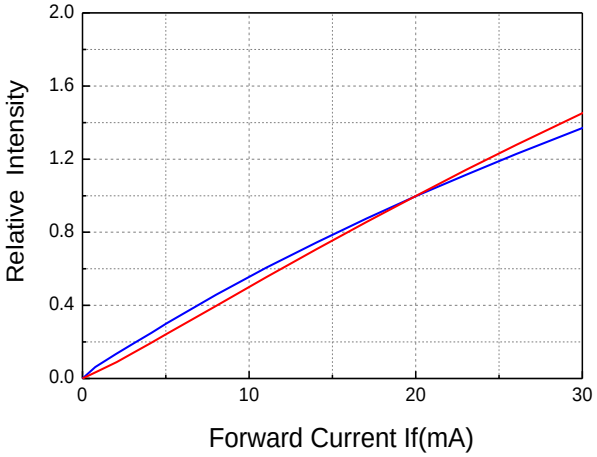
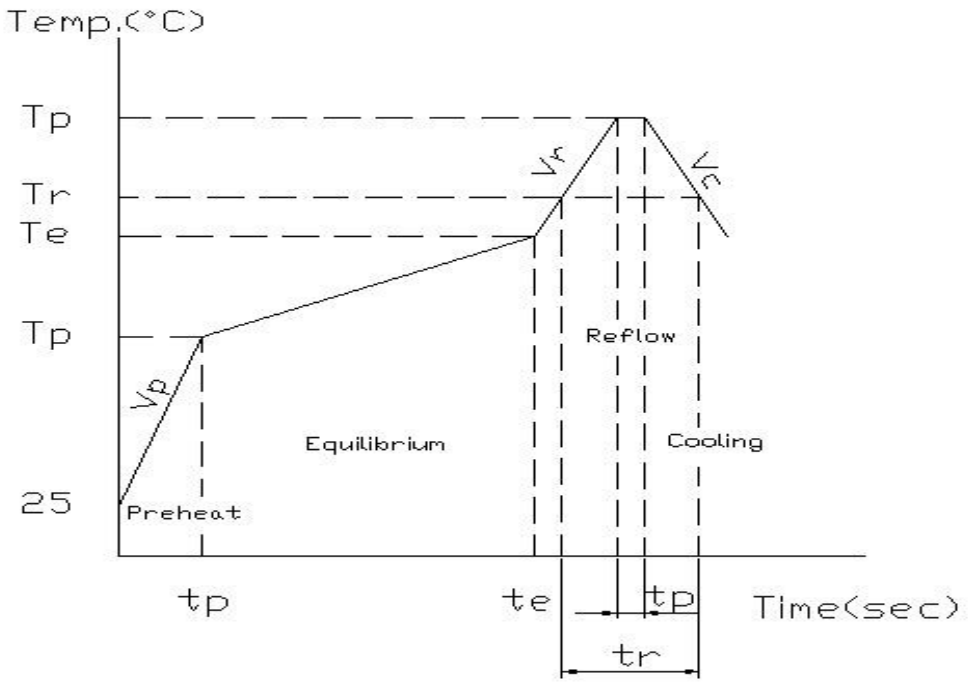


Figure5. Relative Intensity VS. Forward Current

Soldering Characteristics

IR-reflow Condition (Pb free)

Area	Title	Symbol	Min	Max	Unit
(1)Preheat	Ramp-up rate	Vp	1	5	℃/sec
	temperature	Tp	150	–	℃
	time	tp	–	–	sec
(2)Equilibrium	Ramp-up rate	Ve	–	–	℃/sec
	temperature	Te	150	200	℃
	Time	te	60	120	sec
(3)Reflow	Ramp-up rate	Vr	1	5	℃/sec
	temperature	Tr	220	–	℃
	Time	tr	–	60	sec
	Peak temperature	Trp	–	260	℃
	Peak time	trp	–	10	sec
(4)Cooling	Ramp-down rate	Vc	3	6	℃/sec



Hand Soldering (Iron Condition) Soldering

Iron:30W Max

Temperature 350°C Max

Soldering Time:3 Seconds Max(Once)

Distance:1.6mm min(From seating plane)

Reliability Test

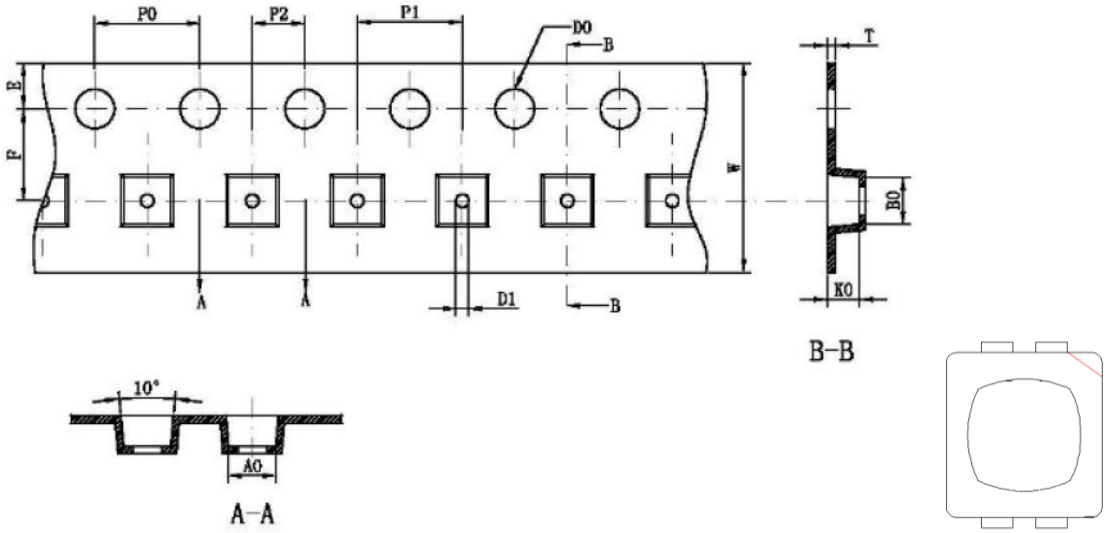
NO.	Test Item	Standard Test Method	Test Conditions	Test Duration	Failure Criteri	Units Failed/Tested
1	Resistance to Soldering Heat	JEITA ED-4701 300 301	Tsld=260°C, 10sec,reflows Pretreatment30°C,70%,168hrs		#1	0/20
2	Solderability (Reflow	JEITA ED-4701 300 303A	Tsld=245±5°C,5sec. Lead-free Solder(Sn-3.0Ag-0.5Cu)		#3	0/20
3	Thermal Shock	JEITA ED-4701 300 307	-40°C~110°C 10min dwell, 10sec transfer,	100cycles	#1	0/20
4	Temperature Cycle	JEITA ED-4701 100 105	-40℃（30min）～25℃（5min）～110℃（30min）～25℃（5min）	100cycles	#1	0/20
5	High Temperature Storage	JEITA ED-4701 200 201	Ta=110°C	1000hrs.	#1	0/20
6	Temperature Humidity	JEITA ED-4701 100 103	Ta=60°C, RH=90%	1000hrs.	#1	0/20
7	Low Temperature Storage	JEITA ED-4701 200 202	Ta=-40°C	1000hrs.	#1	0/20
8	Room Temperature		Ta=25°C, IF=20mA	1000 hrs.	#2	0/20
9	Low Temperature Operating life		Ta=-40°C, IF=20mA	1000hrs.	#2	0/20

Failure Criteria

Criteria #	Items	Conditions	Failure Criteria
#1	Forward Voltage(VF)	IF=20mA	>U.S.L.X1.1
	Luminous Intensity(IV)	IF=20mA	<L.S.L.X0.7
#2	Forward Voltage(VF)	IF=20mA	>U.S.L.X1.1
	Luminous Intensity(IV)	IF=20mA	<L.S.L.X0.5
#3	Solderability		Less than 95% solder coverage

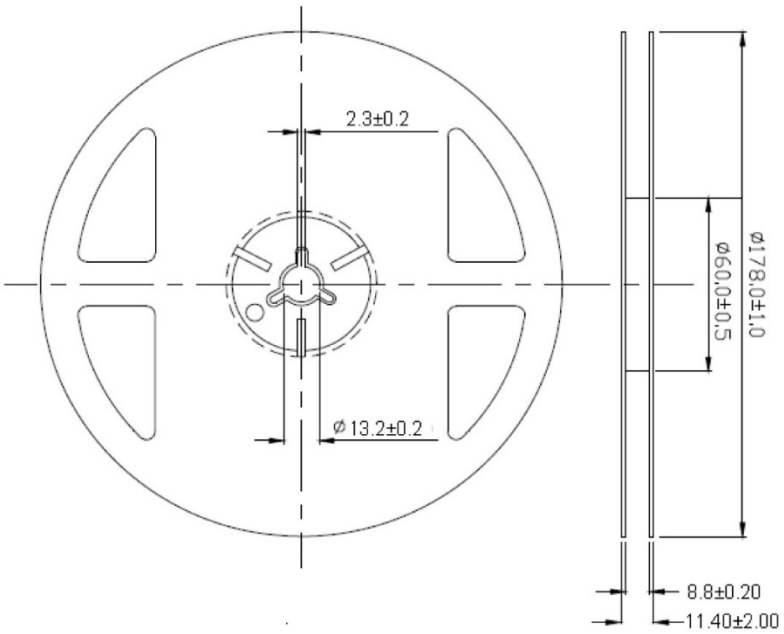
U.S.L.: Upper Specification limit L.S.L.: Lower Specification Limit

Package – Tape Dimensions

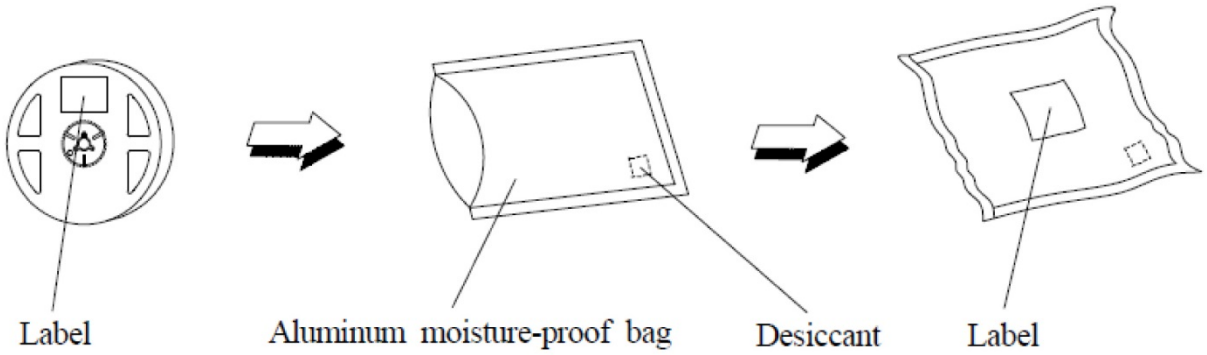


Symbol	A0	B0	K0	P0	P1	P2
Spec	3.1±0.1	3.8±0.1	2.1±0.1	4.0±0.1	4.0±0.1	2.0±0.1
Symbol	E	F	D0	D1	W	T
Spec	1.75±0.10	3.50±0.05	1.5±0.1	1.0±0.1	8.0±0.1	0.235±0.05

Reel Dimensions



Packaging



Package Name	Package Dimensions		Distribution of layer in box		Total		Note
	Size	Unit	Amount	Unit	Amount	Unit	
Reel	Ø178 x 11.4	mm	1	Reel	2000	pcs	
Inner Box	265 x 235 x 78	mm	5	Reel	10000	pcs	
Outer Box	540 x 260 x 170	mm	4	Inner Box	40000	pcs	

	Approved By	Checked By	Notes/Remarks
PLC3528A4-WCRB0801 Customer Approval Signatures			

Record Of Revisions			
Rev.	**Comments**	**Page**	**Date**
0	Released Spec	--	12/20/2018