





ProLight PW2N-2FPE-B 2W PC Blue Power LED Technical Datasheet Version: 1.1

ProLight Opto © PW2N Series

Features

•Good color uniformity •Lead free reflow soldering •RoHS compliant •Instant light (less than 100ns) •No UV Main Applications

Introduction

•PW2N qualifies as the JEDEC Level 1 MSL sensitivity level and suitable for SMD process, Pb_free reflow soldering capability, and full compliance with EU Reduction of Hazardous Substances (RoHS) legislation.

No. 89, Xiyuan Rd., Zhongli City, Taoyuan County 320, Taiwan (R.O.C.) Tel : +886-3-461-8618 Fax : +886-3-461-8677 www.prolightopto.com 2020/01 DS-1338

We Provide the Light to the world



Emitter Mechanical Dimensions



Notes:

- 1. The cathode side of the device is denoted by the chamfer on the part body.
- 2. Drawing not to scale.
- 3. All dimensions are in millimeters.
- 4. Unless otherwise indicated, tolerances are $\pm\,0.10\text{mm}.$
- 5. Please do not solder the emitter by manual hand soldering, otherwise it will damage the emitter.
- 6. Please do not use a force of over 0.3kgf impact or pressure on the lens of the LED, otherwise it will cause a catastrophic failure.
- *The appearance and specifications of the product may be modified for improvement without notice.

We Provide the Light to the world



Flux Characteristics, T_J = 25°C

	Part Number	Luminous Flux Φ _v (Im)			
Color		@35	0mA	Refer @500mA	
	Emitter	Minimum	Typical	Typical	
PC Blue	PW2N-2FPE-B	30	45	60	

• ProLight maintains a tolerance of ± 7% on flux and power measurements.

• Please do not drive at rated current more than 1 second without proper heat sink.

Electrical Characteristics, T_J = 25°C

Forward Voltage V _F (V)						
Color		@350mA		Refer @500mA	Thermal Resistance	
	Min.	Тур.	Max.	Тур.	Junction to Slug (°C/W)	
PC Blue	2.8	3.1	3.4	3.3	10	

ProLight maintains a tolerance of ± 0.1V for Voltage measurements.

Optical Characteristics at 350mA, T_j = 25°C

			Total included Angle	Viewing Angle	
Color	Dominant Wavelength λ _D Min. Typ. Max.			(degrees) θ _{0.90V}	(degrees) 2 θ _{1/2}
PC Blue	465 nm	470 nm	475 nm	160	120

ProLight maintains a tolerance of ± 1nm for dominant wavelength measurements.

We Provide the Light to the world



Absolute Maximum Ratings

Parameter	PC Blue		
DC Forward Current (mA)	500		
Peak Pulsed Forward Current (mA)	500 (less than 1/10 duty cycle@1KHz)		
ESD Sensitivity (HBM per MIL-STD-883E Method 3015.7)	±4000V (Class III)		
LED Junction Temperature	120°C		
Operating Board Temperature at Maximum DC Forward Current	-40°C - 90°C		
Storage Temperature	-40°C - 120°C		
Soldering Temperature	JEDEC 020c 260°C		
Allowable Reflow Cycles	3		
Reverse Voltage	Not designed to be driven in reverse bias		

Photometric Luminous Flux Bin Structure

Color	Bin Code	Minimum Photometric Flux (Im)	Maximum Photometric Flux (Im)	Available Color Bins
PC Blue	Q	30	40	2 [1]
	R	40	50	3 [1]
	S1	50	60	[1]

• ProLight maintains a tolerance of \pm 7% on flux and power measurements.

• The flux bin of the product may be modified for improvement without notice.

• ^[1] The rest of color bins are not 100% ready for order currently. Please ask for quote and order Possibility.

Forward Voltage Bin Structure

Color	Bin Code	Minimum Voltage (V)	Maximum Voltage (V)
	В	2.8	3.0
PC Blue	D	3.0	3.2
	E	3.2	3.4

ProLight maintains a tolerance of ± 0.1V for Voltage measurements.

Note: Although several bins are outlined, product availability in a particular bin varies by production run and by product performance. Not all bins are available in all colors.

We Provide the Light to the world



Color Bin

PC Blue Binning Structure Graphical Representation



PC Blue Bin Structure

Bin Code	x	У	Bin Code	x	У
	0.1246	0.0596		0.1096	0.0868
2	0.1355	0.0399	3	0.1246	0.0596
	0.1750	0.0985	5	0.1747	0.1250
	0.1747	0.1250		0.1743	0.1581

• Tolerance on each color bin (x, y) is ± 0.005

We Provide the Light to the world



Color Spectrum, T_J = 25°C

1. PC Blue



Light Output Characteristics

Relative Light Output vs. Junction Temperature at 500mA



We Provide the Light to the world



Forward Current Characteristics, T_J = 25°C



Ambient Temperature vs. Maximum Forward Current



We Provide the Light to the world



Typical Representative Spatial Radiation Pattern

Lambertian Radiation Pattern



No. 89, Xiyuan Rd., Zhongli City, Taoyuan County 320, Taiwan (R.O.C.) Tel : +886-3-461-8618 Fax : +886-3-461-8677 www.prolightopto.com

Forwar

We Provide the Light to the world



Moisture Sensitivity Level - JEDEC Level 1

			Soak Requirements			
Level	Floo	r Life	Stan	dard	Accelerated	Environment
	Time	Conditions	Time (hours)	Conditions	Time (hours)	Conditions
1	Unlimited	≤30°C / 85% RH	168 +5/-0	85°C / 85% RH	NA	NA

- The standard soak time includes a default value of 24 hours for semiconductor manufature's exposure time (MET) between bake and bag and includes the maximum time allowed out of the bag at the distributor's facility.
- Table below presents the moisture sensitivity level definitions per IPC/JEDEC's J-STD-020C.

	Level Floor Life		Soak Requirements			
Level			Standard		Accelerated Environment	
	Time	Conditions	Time (hours)	Conditions	Time (hours)	Conditions
1	Unlimited	≤30°C / 85% RH	168 +5/-0	85°C / 85% RH	NA	NA
2	1 year	≤30°C / 60% RH	168 +5/-0	85°C / 60% RH	NA	NA
2a	4 weeks	≤30°C / 60% RH	696 +5/-0	30°C / 60% RH	120 +1/-0	60°C / 60% RH
3	168 hours	≤30°C / 60% RH	192 +5/-0	30°C / 60% RH	40 +1/-0	60°C / 60% RH
4	72 hours	≤30°C / 60% RH	96 +2/-0	30°C / 60% RH	20 +0.5/-0	60°C / 60% RH
5	48 hours	≤30°C / 60% RH	72 +2/-0	30°C / 60% RH	15 +0.5/-0	60°C / 60% RH
5a	24 hours	≤30°C / 60% RH	48 +2/-0	30°C / 60% RH	10 +0.5/-0	60°C / 60% RH
6	Time on Label (TOL)	≤30°C / 60% RH	Time on Label (TOL)	30°C / 60% RH	NA	NA

For

We Provide the Light to the world



Recommended Solder Pad Design

Standard Emitter



All dimensions are in millimeters.

We Provide the Light to the world



Reflow Soldering Condition

Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly	
Average Ramp-Up Rate	2°C / second may	2°C / second max	
(T _{Smax} to T _P)	5 C7 Second max.	5 C7 Second max.	
Preheat			
– Temperature Min (T _{smin})	100°C	150°C	
– Temperature Max (T _{Smax})	150°C	200°C	
– Time (t _{smin} to t _{smax})	60-120 seconds	60-180 seconds	
Time maintained above:			
– Temperature (T _L)	183°C	217°C	
– Time (t _L)	60-150 seconds	60-150 seconds	
Peak/Classification Temperature (T _P)	240°C	260°C	
Time Within 5°C of Actual Peak	10.20 seconds	20.40 seconds	
Temperature (t _P)		20-40 seconds	
Ramp-Down Rate	6°C/second max.	6°C/second max.	
Time 25°C to Peak Temperature	6 minutes max.	8 minutes max.	



- We recommend using the M705-S101-S4 solder paste from SMIC (Senju Metal Industry Co., Ltd.) for lead-free soldering.
- Do not use solder pastes with post reflow flux residue>47%. (58Bi-42Sn eutectic alloy, etc) This kind of solder pastes may cause a reliability problem to LED.
- All temperatures refer to topside of the package, measured on the package body surface.
- Repairing should not be done after the LEDs have been soldered. When repairing is unavoidable, a double-head soldering iron should be used. It should be confirmed beforehand whether the characteristics of the LEDs will or will not be damaged by repairing.
- Reflow soldering should not be done more than three times.
- When soldering, do not put stress on the LEDs during heating.
- After soldering, do not warp the circuit board.

We Provide the Light to the world



Emitter Reel Packaging



Notes:

- 1. Drawing not to scale.
- 2. All dimensions are in millimeters.
- 3. Unless otherwise indicated, tolerances are \pm 0.10mm.

No. 89, Xiyuan Rd., Zhongli City, Taoyuan County 320, Taiwan (R.O.C.) Tel : +886-3-461-8618 Fax : +886-3-461-8677 www.prolightopto.com

We Provide the Light to the world



Emitter Reel Packaging



Notes:

- 1. Empty component pockets sealed with top cover tape.
- 2. 3000 pieces per reel.
- 3. Drawing not to scale.
- 4. All dimensions are in millimeters.

We Provide the Light to the world



Precaution for Use

Storage

Please do not open the moisture barrier bag (MBB) more than one week. This may cause the leads of LED discoloration. We recommend storing ProLight's LEDs in a dry box after opening the MBB. The recommended storage conditions are temperature 5 to 30 °C and humidity less than 40% RH. It is also recommended to return the LEDs to the MBB and to reseal the MBB.

- The slug is is not electrically neutral. Therefore, we recommend to isolate the heat sink.
- We recommend using the M705-S101-S4 solder paste from SMIC (Senju Metal Industry Co., Ltd.) for lead-free soldering.
- Do not use solder pastes with post reflow flux residue>47%. (58Bi-42Sn eutectic alloy, etc) This kind of solder pastes may cause a reliability problem to LED.
- Any mechanical force or any excess vibration shall not be accepted to apply during cooling process to normal temperature after soldering.
- Please avoid rapid cooling after soldering.
- Components should not be mounted on warped direction of PCB.
- Repairing should not be done after the LEDs have been soldered. When repairing is unavoidable, a heat plate should be used. It should be confirmed beforehand whether the characteristics of the LEDs will or will not be damaged by repairing.
- This device should not be used in any type of fluid such as water, oil, organic solvent and etc. When cleaning is required, isopropyl alcohol should be used.
- When the LEDs are illuminating, operating current should be decide after considering the package maximum temperature.
- The appearance, specifications and flux bin of the product may be modified for improvement without notice. Please refer to the below website for the latest datasheets. http://www.prolightopto.com/

Handling of Silicone LEDs

Notes for handling of silicone LEDs

- Please do not use a force of over 0.3kgf impact or pressure on the silicone, otherwise it will cause a catastrophic failure.
- The LEDs should only be picked up by making contact with the sides of the LED body.
- Avoid touching the silicone especially by sharp tools such as Tweezers.
- Avoid leaving fingerprints on the silicone.
- Please store the LEDs away from dusty areas or seal the product against dust.
- When populating boards in SMT production, there are basically no restrictions
 regarding the form of the pick and place nozzle, except that mechanical pressure
 on the silicone lens must be prevented.
- Please do not mold over the silicone lens with another resin. (epoxy, urethane, etc)





We Provide the Light to the world