

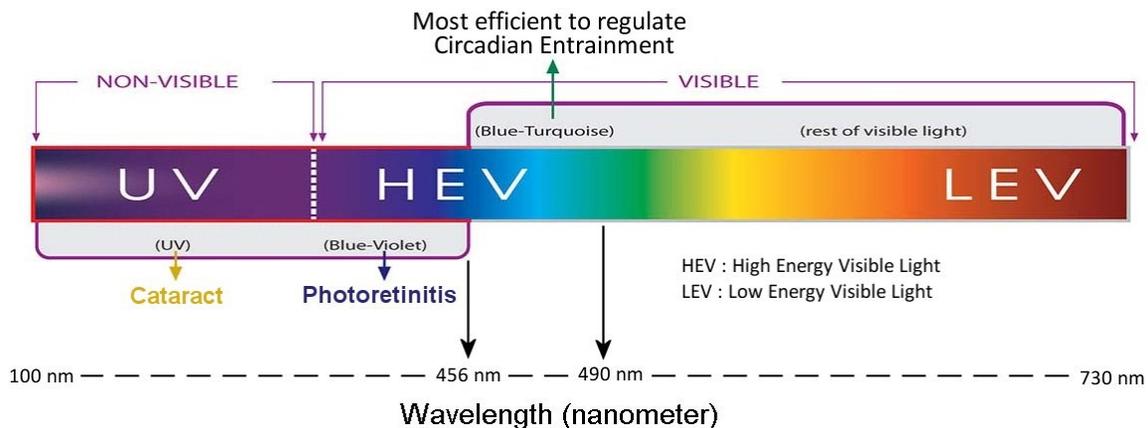
LiteBlue LED produces white light using GaN-based die of 465 – 470 nanometers wavelength and then excited through a phosphor coating of special formula. The generated blue light is most sensitive in suppressing Melatonin secretion and thus important to regulate the Circadian Rhythm, when compared with other wavelengths. Blue light can be classified into two categories,



Blue-violet light (415 - 455 nanometers)

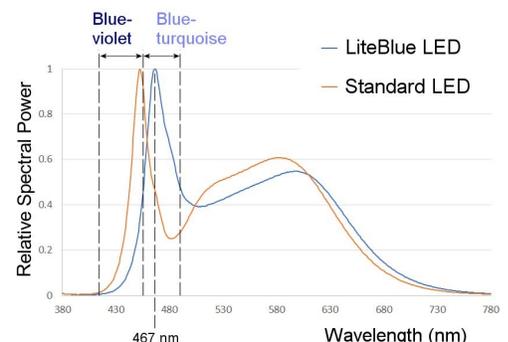
Blue-turquoise light (456 - 490 nanometers)

LiteBlue LED produces much higher amount of blue-turquoise light when compared with standard type of LED based on blue pump of 440 - 450 nanometers. At the same time, the amount of blue-violet light is greatly reduced.



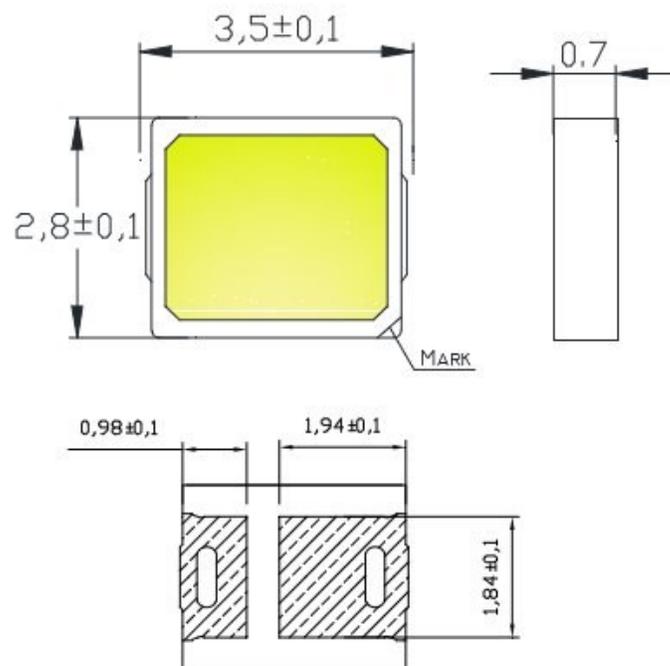
By shifting the peak blue wavelength to 465 - 470 nanometers, **LiteBlue** LED emits abundant amount of blue-turquoise light having the following benefits,

- More efficient to regulate the circadian entrainment than blue-violet light during daytime. It also helps cognitive function, elevates moods and synchronizes body-clock.
- Being less sensitive to Retinal Blue Light Hazard stated in IEC/EN 62471 (Photobiological safety of lamps and lamp systems), which is related to the Photoreinitis, i.e., photochemical retinal hazard caused by high-energy incident light to instigate damage in the retina. Thus, lower L_B (Retinal Blue Light Radiance) can be achieved.



Product specification

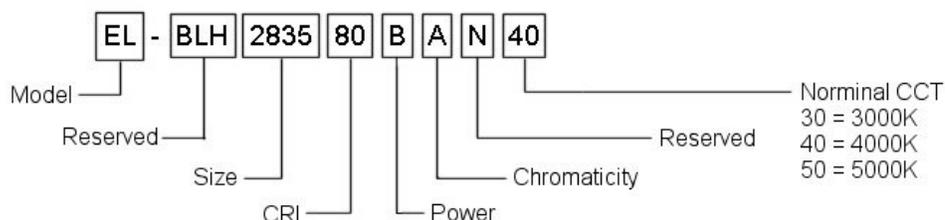
Model	EL series
Part number	LB2835-40-465
Ordering number	EL-BLH283580BAN40
LED die material	GaN (Gallium Nitride)
LED die wavelength	465 - 470 nanometers
Package Size	3.50 × 2.80 × 0.7 mm
Viewing angle	120 degree
Color temperature	4000K CCT
Melanopic ratio (@WELL v2)	0.837 (typ.)
Luminous Efficiency	150 lumen/Watt (typ.) at $I_F = 60\text{mA}$
Color Rendering Index	84% (typ.)
RoHS compliant lead-free soldering	compatible



Notes: 1) All dimensions are in millimeters

2) Tolerances are ± 0.05 mm unless otherwise stated

Product Nomenclature



Absolute maximum ratings

	Symbol	Value	Unit
Power dissipation	Pd	0.2	W
Forward current	I _F	60	mA
Reverse voltage	V _R	5	V
Operating temperature range	Topr	-40 to +100	°C
Storage temperature range	Tstg	-40 to +100	°C
Pulse forward current	I _{FG}	80	mA
Electrostatic discharge	ESD	1000 (HBM)	V

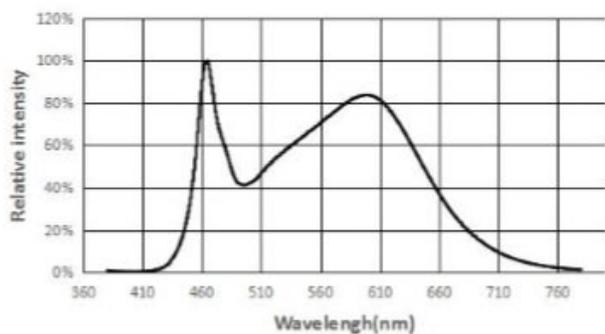
Electro-optical characteristics

	Test condition	Symbol	Min.	Typ.	Max.	Unit
Forward voltage	I _F = 60 mA	V _F	2.8	3.0	3.1	V
Luminous flux	I _F = 60 mA	Φ	25	26	27	lm
Viewing angle 50% I _v	I _F = 60 mA	2θ _{1/2}	-	120	-	deg
Reverse current	V _R = 5V	I _R	-	-	0.01	mA
Color temperature	I _F = 60 mA	T _C	3800	4000	4250	K
Chromaticity CIE	I _F = 60 mA	CIE	Refer to CIE 1931 diagram			
CRI (Ra)	I _F = 60 mA	Ra	≥ 80%			

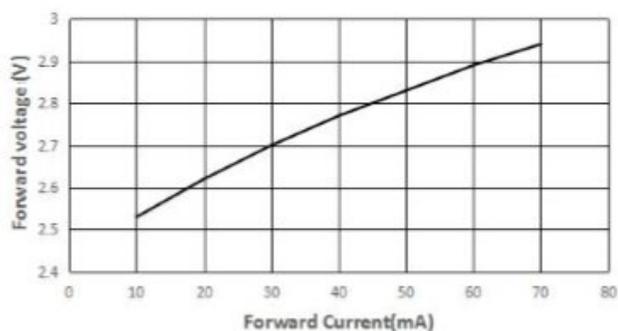
- Notes :
1. Luminous flux measurement tolerance : ±10%
 2. Forward voltage measurement tolerance : ± 0.1V
 3. Color temperature measurement tolerance : ± 0.005
 4. CRI (Ra) measurement tolerance : ± 1%

Typical electro-optical characteristics curves

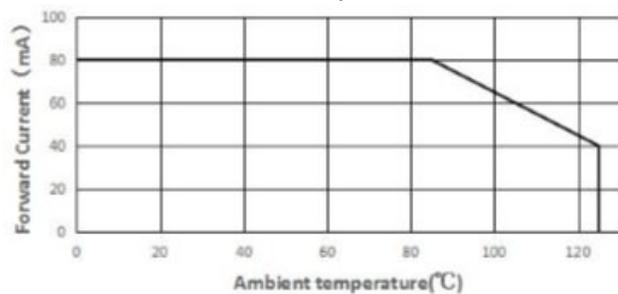
Relative intensity vs Wavelength



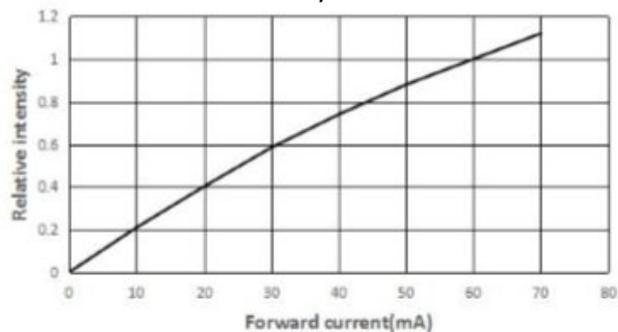
Forward current vs Forward voltage



Forward current derating curve
vs Ambient temperature



Relative intensity vs Forward current



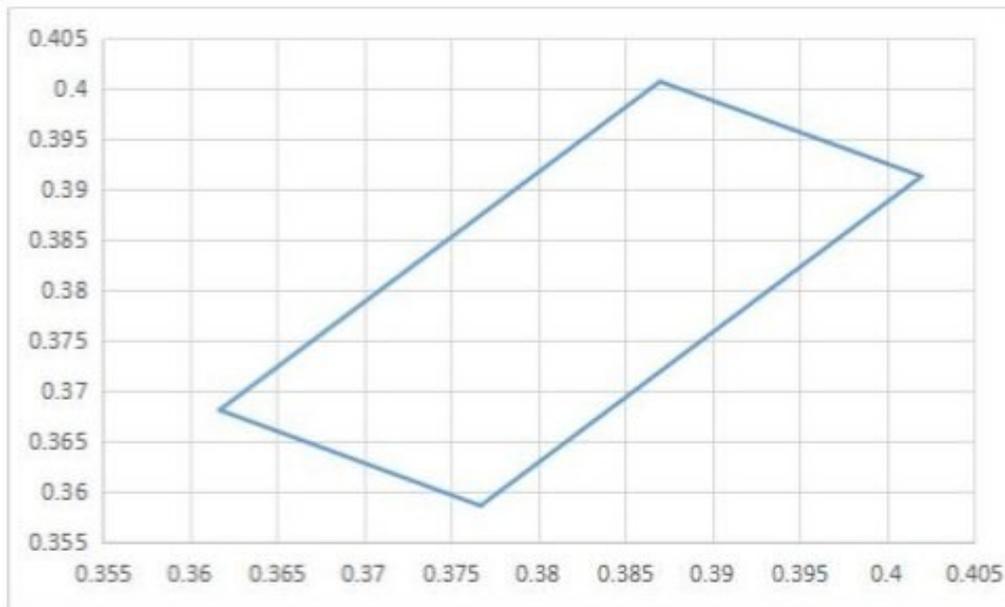
Flux Bin Limit (IF =60mA)

Bin code	Minimum (lumen)	Maximum (lumen)
025	25	27

VF Bin Limit (IF =60mA)

Bin code	Minimum (Volt)	Maximum (Volt)
A3	2.8	2.9
A4	2.9	3.0
A5	3.0	3.1

Chromaticity



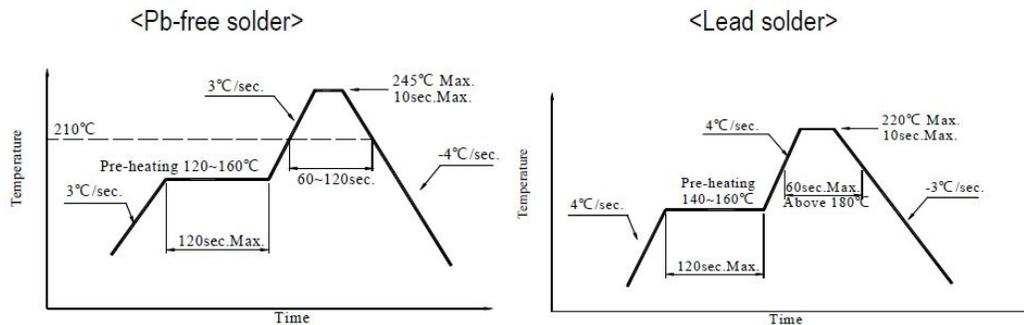
CIE 1931 x,y Chromaticity Diagram

Color Temperature	CCx	CCy
4000K CCT	0.3617	0.3681
	0.3767	0.3586
	0.402	0.3913
	0.387	0.4007

Requirements for application and reflow soldering

Pre-heat	120 - 160°C
Pre-heat time	120 seconds max
Peak temperature	245°C max
Condition	Refer to temperature profile

1. After reflow soldering, rapid cooling should be avoided.
2. Use the following conditions shown in the figure below.



3. Reflow soldering should not be done more than two times.
4. When soldering, do not put stress on the LED during heating.

Handling precautions

Compared with epoxy encapsulation that is hard and brittle, silicone is softer and flexible. Although its characteristic significantly reduces thermal stress, it is more prone to damage by external mechanical force. As a result, special handling and precautions must be observed during assemblies using silicone encapsulated LED product. Failure to comply may lead to damage and premature failure of the LED.

- ◆ Handle the component along the side surface by using forceps or appropriate tools. Please do not touch the Silicone lens surface, because it may damage the internal circuitry.
- ◆ Do not stack the LED on top of each other. Improper handling may scratch the silicone lens or damage the internal circuitry.
- ◆ Not suitable to operate in acidic environment, PH<7.
- ◆ LED operating environment and sulfur element composition cannot be over 25 PPM in the LED mating usage material.
- ◆ When external glue for LEDs application products is used, please make sure that the external glue matches the LEDs packaging glue. Additionally, as most of LED packaging glue is silica gel, and it has strong Oxygen permeability as well as strong moisture permeability. In order to prevent external material from getting into the inside of LEDs to cause malfunction of LED, each content of Bromine and Chlorine is required to be less than 225 PPM. The combined content of Bromine and Chlorine in the external glue of the application products is required to be less than 375 PPM.

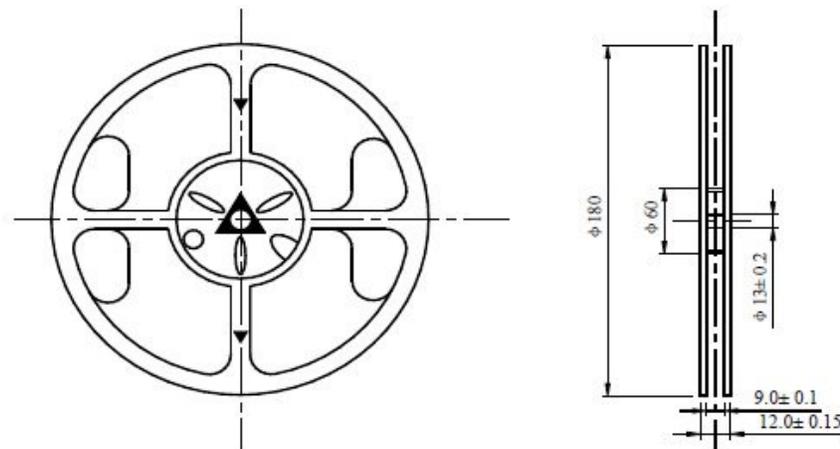
- ◆ The encapsulated material of the LED is silicone. Therefore the LED has a soft surface on the top of package. The pressure on the top surface will affect the reliability of the LED. Precautions should be taken to avoid the strong pressure on the encapsulated part. So when using the picking up nozzle, the pressure on the silicone resin should be properly applied.
- ◆ Static electricity or surge voltage damages the LED. Damaged LED will show some unusual characteristics, such as lower forward voltage, or even no light emitted. All devices, equipment and machinery must be properly grounded. At the same time, it is recommended that wrist bands or anti-electrostatic gloves, anti-electrostatic containers are used when dealing with the LED.

Storage

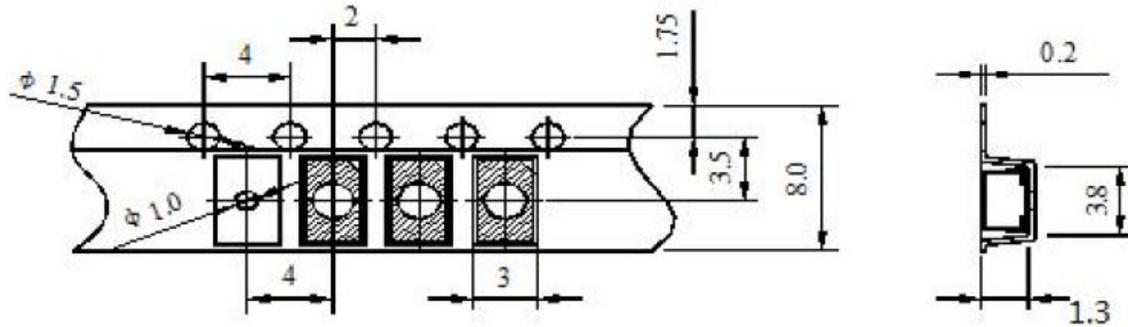
- ◆ Before opening the package, the LED should be kept at temperature of 30°C or less and humidity of 60% RH or less, and the LED should be used within a year.
- ◆ After opening the package, the LED should be stored at temperature of 30°C or less and humidity of 10% RH or less, and the LED should be soldered within 24 hours. It is recommended that the LED is best operated at temperature of 30°C or less and humidity of 60% RH or less. For unused LED, it should be stored in moisture proof packages, such as sealed containers with packages of moisture absorbent material (silica gel). It is also recommended to return the LED to the original moisture proof bag and to reseal the moisture proof bag again.

Packaging

A) Package tape specifications: 4000 pieces/reel



B) Dimensions of tape (Unit in millimetre)



- Notes :
1. Empty component pockets are sealed with top cover tape.
 2. The maximum number of missing LED lamp is two.
 3. The cathode is oriented towards the tape sprocket hole in accordance with data sheet specifications.