DATASHEET

Internatix ChromaLit[™] Remote Phosphor Light Source

Product Features

- Unsurpassed flexibility, 110 27,500
 lumens per foot available through various design formats
- High CRI, up to 98 CRI available
- 3 SDCM color consistency
- Up to 30% higher system efficiency compared to white LED solutions

Application Benefits

- New colors with same blue light engine,streamlining supply and production of luminaires
- Uniform illuminance and appearance, no reflections or pixelation
- Consistency of lumens and color over life

Applications & Uses

- Down lights
- Spots and modules
- Entertainment
- Task lighting
- Under cabinet
- Panel lighting
- High bay





Horner Lighting - A200



CINEO - TrueColor LS

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Product Nomenclature

ChromaLit products are identified by the following product nomenclature:

Product order code

CL - ABC - DEFG - PC

Where:

CL - Designates the ChromaLit product family

A - Designates first digit in CRI

8 = 80 CRI minimum

BC - Designates the first two digits in CCT

30 = 3000K, 40 = 4000K, etc.

DEFG - Designates dimensions

R100 = 100mm Round

PC - Designates the standard polycarbonate material for ChromaLit

Example:

CL-840-R75-PC: ChromaLit, 80CRI, 4000K CCT, 75mm Round, Polycarbonate

Minor Product Change Policy

The rigorous qualification testing of ChromaLit products ensures product performance. Slight cosmetic changes which do not affect the form fit or function of the product may occur as Internatix continues product optimization.



Optical Characteristics

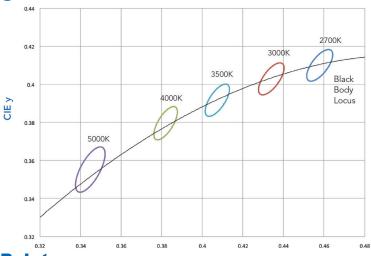
ChromaLit White Light Source Portfolio and Optical Performance Characteristics¹

Product	Nominal CCT ²		olor stency³	Min CRI ⁴									ConversionEfficacy⁵ (Lm/W _{rad}) at 25°C	
	(K)	SDCM	CCT (K)		CRI ⁴ (deg)	Min.	Typical							
CL-827	2700	3	<u>+</u> 70	80	115	165	180							
CL-927	2700	3	<u>+</u> 70	90	115	145	161							
CL-830	3000	3	<u>+</u> 90	80	115	185	202							
CL-930	3000	3	<u>+</u> 90	90	115	155	165							
CL-835	3500	3	<u>+</u> 110	80	115	190	210							
CL-840	4000	3	<u>+</u> 120	80	115	195	218							
CL-750	5000	4	<u>+</u> 170	70	115	215	230							

Notes

- Performance based on reference design. Please refer to application note for details on reference design. Internatix maintains a tolerance of ±7% on luminous flux, radiant watt and CCT measurements. Internatix maintains a tolerance of 0.5 SDCM on color consistency measurements.
- 2. Correlated Color Temperature
- 3. Color Consistency is dependent on the average dominant wavelength of blue LEDs. ChromaLit will achieve the color consistency values indicated in the table above with uniform blue LED average dominant wavelength. 2.5nm (±1.25mm) of average blue LED wavelength variation will provide 4 SDCM of color consistency for 5000K products. 5mm (±2.5mm) of average blue LED dominant wavelength variation will provide 5 SDCM of color consistency. Values are approximate; please refer to the ChromaLit binning diagram for exact bin definition.
- 4. Minimum CRI rating is based on reference design using blue LEDs with average dominant wavelength of 455nm. Blue LED populations with an average wavelength shorter than 455nm may result in CRI's below specified values.
- Conversion Efficacy is the luminous flux (white light) output per radiant watt of blue light input to ChromaLit. W_{rad} is the radiometric power measured in watts. Conversion efficacy is rated based on reference operation and dominant blue LED wavelength of 455nm (peak wavelength of 450nm)

Color Binning Diagram

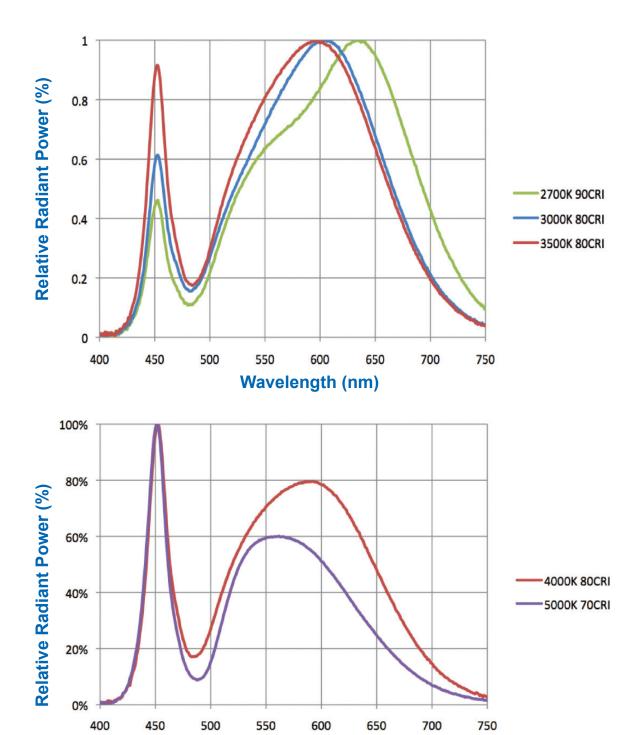


CIE x

Color Bin Center Points

Nominal CCT (K)	х	у
3000	0.4338	0.4030
3500	0.4073	0.3917
4000	0.3818	0.3797
5000	0.3447	0.3553

Relative Spectral Power Distribution

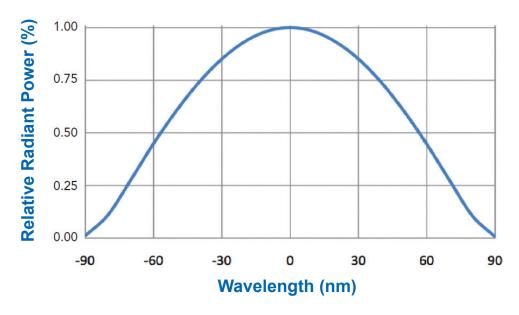


Wavelength (nm)



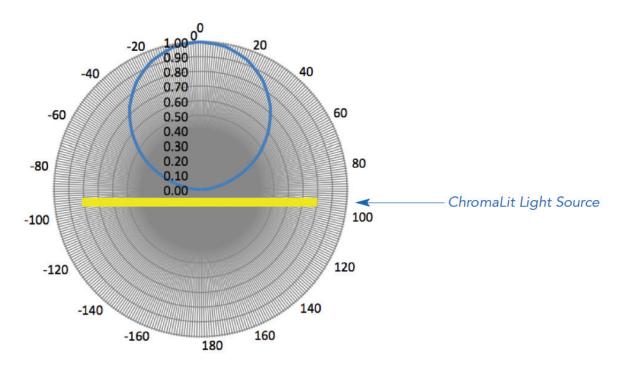
Intensity Distribution

Luminous Intensity Distribution Diagram¹



1. Intensity distribution pattern is characterized using CL-830-LR-PC products and reference design.

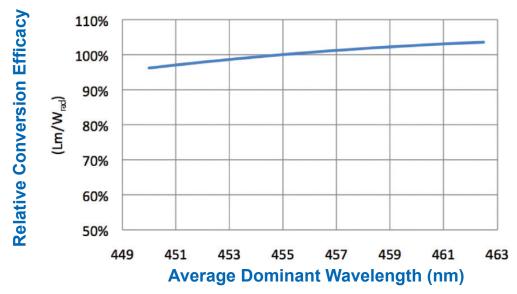
Luminous Intensity Polar Distribution Diagram





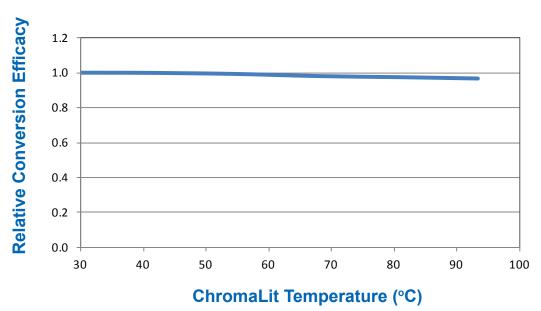
Performance Characteristics Over Wavelength

Relative Conversion Efficacy Over Wavelength¹



^{1.} Relative conversion efficacy does not reflect performance of blue LED over dominant wavelength.

Relative Conversion Efficacy over Temperature



Relative CIE Chromaticity Shift Over Wavelength

	Average Dominant Wavelength				
	450nm	452.2nm	455nm	457.5nm	460nm
Δ CIE X Coordinate	-0.003	-0.002	0	0.001	0.001
Δ CIE Y Coordinate	-0.014	-0.007	0	0.005	0.008



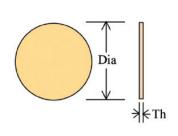
Absolute Maximum and Minimum Ratings

Description	Maximum and Minimum Values
Maximum operating temperature (Tmax1)	95°C
Minimum operating temperature	-40°C
Maximum storage temperature	95°C
Minimum storage temperature	-40°C
Response time to full light output	10µs

¹ Tmax is the maximum temperature measured on the inner surface of ChromaLit. Please consult application notes for additional information on measurement location.

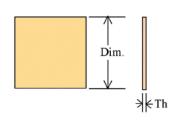
Mechanical Characteristics

ChromaLit Round Mechanical Diagram*



Dimension Designation	Diameter (mm)¹	Diameter (in.)	Example Application	Typical Lumen Output (lm) ²
R23	22.5	0.9	Single LED	110-200
R34	34.0	1.3	Spot Lighting	220-400
SR	45.0	1.8		440-800
LR	61.5	2.4		730-1300
R75	75.0	3.0	Down Light	1100-2000
R100	100.0	3.9		2200-4000
R135	135.0	5.3		3600-6600
R215	215.0	8.5	High Bay	14000-16500

ChromaLit Square Mechanical Diagram*



Dimension Designation	LxW (mm) ¹	Dimensions LxW (in.)	Example Application	Typical Lumen Output (lm)²
S21	21.0 x 21.0	0.8 x 0.8	Single LED	110-200
S40	40.0 x 40.0	1.6 x 1.6		440-800
S55	55.0 x 55.0	2.2 x 2.2		730-1300
S65	65.0 x 65.0	2.6 x 2.6	Down Light	1100-2000
S95	95.0 x 95.0	3.7 x 3.7		2200-4000
S120	120.0 x 120.0	4.7 x 4.7		3600-6600
S200	200.0 x 200.0	7.9 x 7.9	High Bay	14000-16500

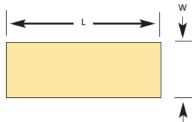


ChromaLit Linear Mechanical Diagram*



Dimension Designation	Dimensions LxW (mm) ¹	Dimensions LxW (in.)	Example Application	Typical Lumen Output (lm)²
L225	305.0 x 22.5	12.0 x 0.9	Task/Linear/	950-2400
L125	305.0 x 12.5	12.0 x 0.5	Panel Lighting	950-1400

ChromaLit Panel Mechanical Diagram*



Dimension Designation	Dimensions LxW (mm) ¹	Dimensions LxW (in.)	Example Application	Typical Lumen Output (lm)²
P215	305.0 x 215.0	12.0 x 8.5	Custom	15000-27500

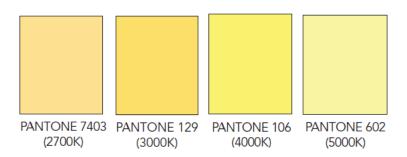
Notes

- *Product performance based on reference design. Product specifications subject to change.
- 1. Typical dimension tolerances for length and width are ± 0.2 mm. Typical dimension tolerances for round is ± 0.2 mm for <100mm diameter. Typical dimension tolerances for round is ± 0.5 mm for ≥ 100 mm diameter.
- 2. Typical lumen output is estimated based on typical blue LED radiometric watts recommended.

Additional Mechanical Characteristics

Characteristic	Value
Thickness	2.1mm <u>+</u> 0.1mm
Orientation	Glossy side out, Matte side facing LED
Off-State Color	PANTONE 7403 (2700K, 90CRI)
(Glossy side, representation	PANTONE 129 (3000K, 80CRI)
using PANTONE color match	PANTONE 106 (4000K, 80CRI)
system)	PANTONE 602 (5000K, 70CRI)

Off-State Color





Reliability and Environmental Ratings

Description	Typical Values
Temperature / Humidity (non-condensing)	60°C 90% RH
Coefficient of Thermal Expansion	70 ppm / °C
Flame Rating ¹	НВ
RoHS	RoHS Compliant
REACH	REACH Compliant

¹ Flame rating indicated based on UL rating of bulk material used for ChromaLit. Flammability is dependent on both material and geometry and ChromaLit has been tested to exceed higher flammability ratings in finished lighting products. V0 rated versions available upon request - please contact your Internatix sales representative for additional details.

Handling Considerations

Since a dirty or damaged phosphor layer could result in alteration in product performance, ChromaLit should be handled similarly to most optical components. It is best to handle the parts at the edges and prevent mechanical abrasion. If epoxies are used, they must be kept off of the entrance or exit apertures of ChromaLit, since they could greatly impact performance. If parts require cleaning, use a lint free tissue, isopropanol (IPA), or mild detergent. Dry using compressed air (CDA).

About Internatix

Internatix develops essential phosphor materials to drive the LED lighting revolution. The company's comprehensive range of products and solutions can be used to build foundations for the world's LED lighting products and systems including general lighting, displays, automotive and many others. A broad selection of products and innovative delivery systems accelerate time-to-market, improve light quality and efficacy and reduce costs. For more information, please visit www.intematix.com.

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