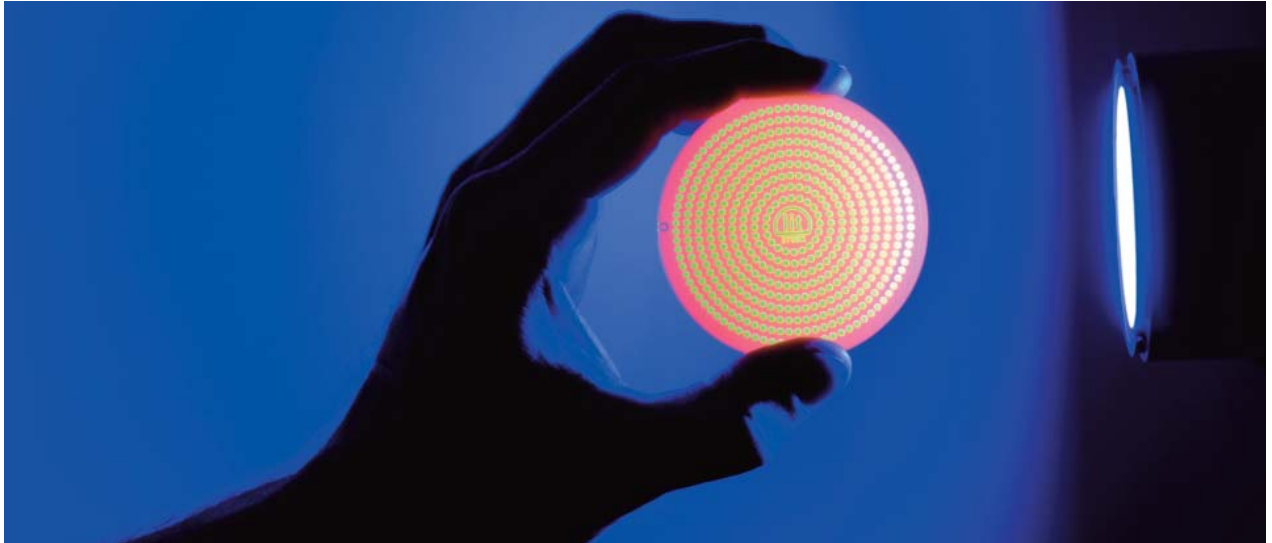


DATASHEET

Intematix ChromaLit™ *Remote Phosphor Light Source*



Features & Benefits

- Unprecedented design freedom for solid state lighting products and systems
- Customizable shape, size and CCT
- Custom saturated colors available
- Powered by radiant energy from blue LEDs, lasers and OLEDs
- Streamlined supply and production of luminaires
- Glare free and uniform light quality
- High CRI
- Consistent color matching
- Up to 30% higher system efficacy compared to conventional LED lighting designs

Applications and Uses

- Downlights
- Spots and modules
- Modular shapes for linear lighting
- Retrofit lamps
- Task lighting
- High bay
- Panel lighting
- Colored lighting for signals and vehicles

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Product Nomenclature

The part number designation for the CL series is explained as follows:
CL-xxx-yyyy-zz

Where:

X—Designates first digit in CRI followed by the first two digits in CCT

Y—Designates dimension

Z—Designates substrate material

Example:

CL-830-R75-PC represents ChromaLit 80CRI, 3000K CCT, 75mm Round, Polycarbonate

Optical Characteristics

ChromaLit White Light Source Portfolio and Optical Performance Characteristics

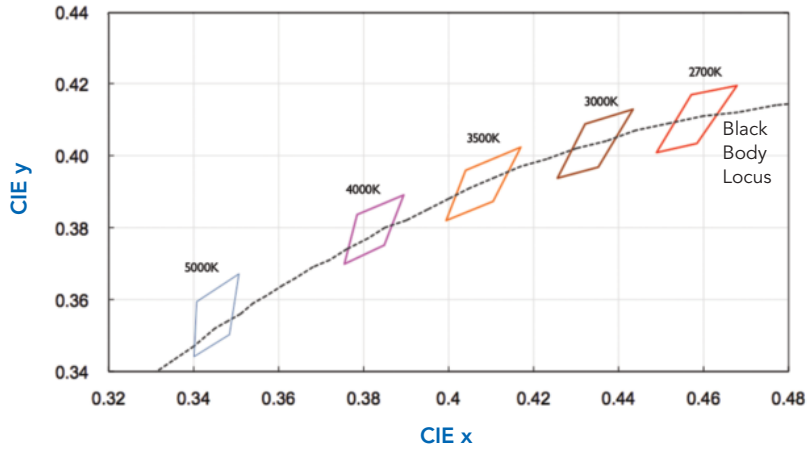
Color Designation	CCT ¹ (K)	Color Consistency ²		CRI ⁴	Viewing Angle ¹ (deg)	Conversion Efficacy ³ (lm/W _{rad}) at 25° C		Conversion Efficacy ³ (lm/W _{rad}) at 80° C	
		SDCM	CCT (K)			Minimum	Typical	Minimum	Typical
CL-927	2700	3	±70	90	115	145	161	140	155
CL-830	3000	3	±90	80	115	185	202	180	195
CL-930	3000	3	±90	90	115	155	165	150	160
CL-835	3500	3	±110	80	115	190	210	186	200
CL-840	4000	3	±120	80	115	195	218	190	205
CL-750	5000	4	±170	70	115	215	230	210	225

Notes:

- 1. Reference Operation** Please refer to reference design guide for detail on reference operation
- 2. Color Consistency** is dependent on the AVERAGE dominant wavelength of blue LEDs. ChromaLit will achieve 3 SDCM with uniform blue LED average dominant wavelength. 2.5nm (±1.25nm) of average blue LED wavelength variation will provide 4 SDCM of color consistency. 5nm (±2.5nm) of average blue LED dominant wavelength variation will provide 5 SDCM of color consistency. See ChromaLit Binning Diagram
- 3. Conversion Efficacy** is the luminous flux (white light) output per radiant watt of blue light input to the remote phosphor source. Wrad 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). Intematix maintains tolerance of ± 7% on flux and chromaticity measurements.
- 4. Minimum CRI** rating is based on reference design using blue LEDs with average dominant wavelength of 455nm. Please refer to page 8 for more information on performance characteristics over wavelength.

Optical Characteristics (Continued)

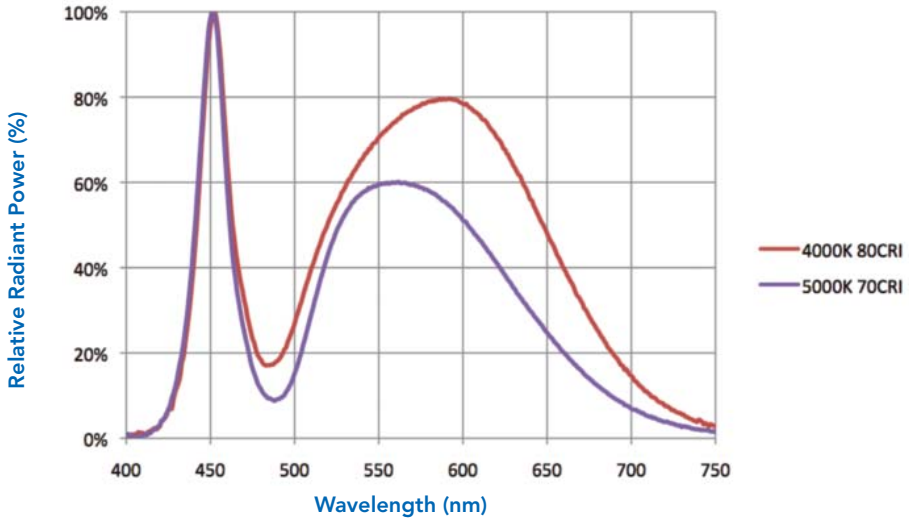
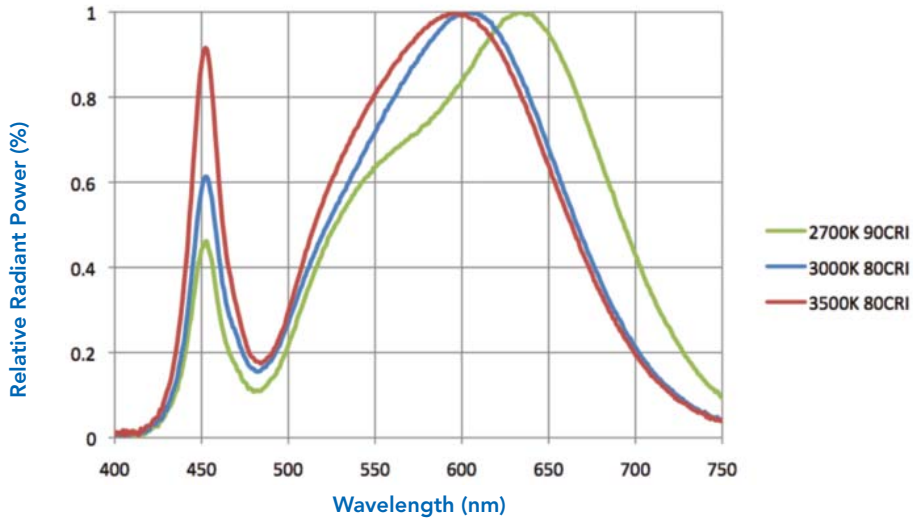
ChromaLit Binning Diagram



ChromaLit Bin Coordinates

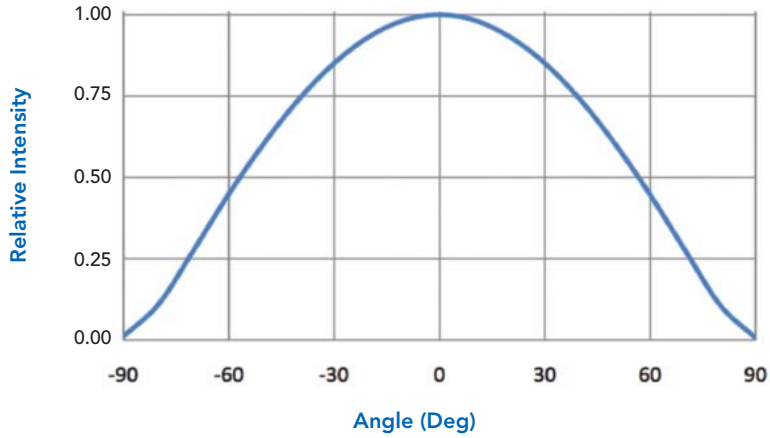
Typical CCT	x	y	Typical CCT	x	y	Typical CCT	x	y
2700K	0.4571	0.4169	3000K	0.4321	0.4088	3500K	0.4040	0.3959
	0.4489	0.4008		0.4256	0.3937		0.3994	0.3820
	0.4584	0.4034		0.4352	0.3968		0.4105	0.3873
	0.4679	0.4194		0.4434	0.4129		0.4170	0.4023
Typical CCT	x	y	Typical CCT	x	y			
4000K	0.3785	0.3836	5000K	0.3407	0.3594			
	0.3755	0.3699		0.3401	0.3442			
	0.3848	0.3751		0.3484	0.3503			
	0.3894	0.3890		0.3506	0.3671			

Relative Spectral Power Distribution



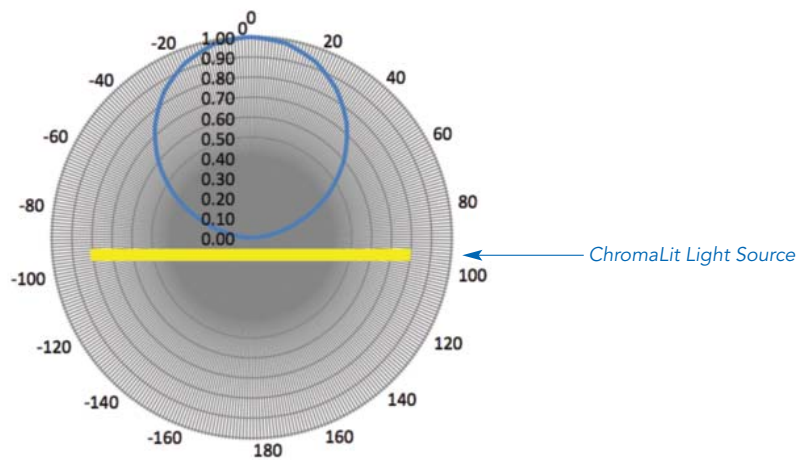
Intensity Distribution

Luminous Intensity Distribution Diagram¹



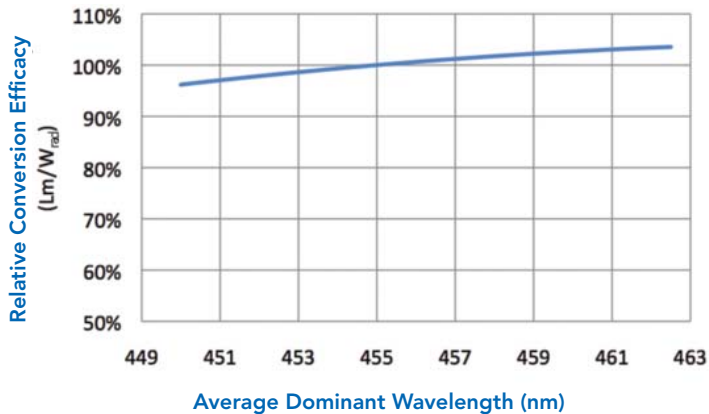
¹Intensity distribution pattern is characterized using CL-830-LR-PC products and reference design.

Luminous Intensity Polar Diagram



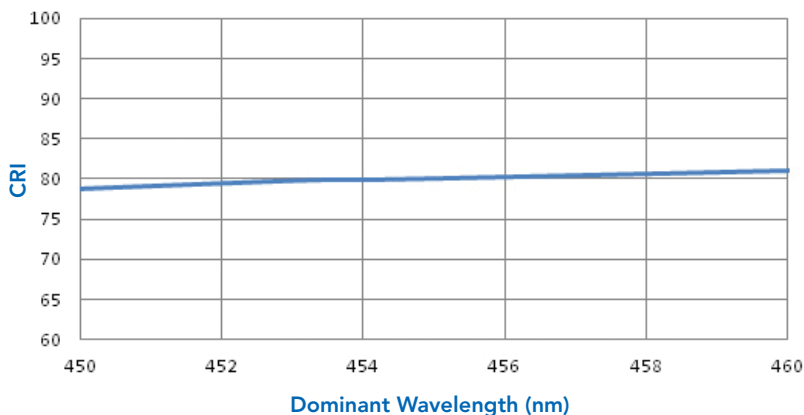
Performance Characteristics over Wavelength

Relative Conversion Efficacy over Wavelength¹



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

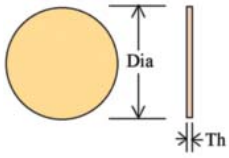
Minimum CRI over Wavelength



Relative CIE Chromaticity Shift over Wavelength

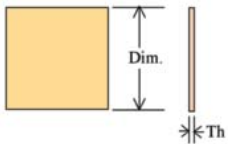
	Average Dominant Wavelength				
	450nm	452.5nm	455nm	457.5nm	460nm
Δ CIE X Coordinate	-0.003	-0.002	0	0.001	0.001
Δ CIE Y Coordinate	-0.014	-0.007	0	0.005	0.008

Mechanical Characteristics



ChromaLit Round *

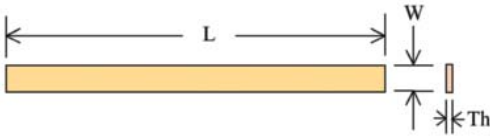
Dimension Designation	Diameter ¹ (mm)	Diameter (in.)	Example Application	Typical Lumen Output (lm) ²
R23	22.5	0.9	Single LED	110-200
R34	34.0	1.3	Spot Lighting	220-400
SR	45.0	1.8	Downlight	440-800
LR	61.5	2.4		730-1300
R75	75.0	3.0		1100-2000
R100	100.0	3.9		2200-4000
R135	135.0	5.3		3600-6600
R215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



ChromaLit Square *

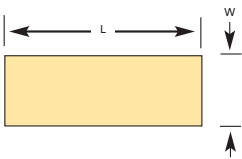
Dimension Designation	Dimensions L X W (mm) ¹	Dimensions L X W (in.)	Example Application	Typical Lumen Output (lm) ²
S21	21.0 x 21.0	0.8 x 0.8	Single LED	110-200
S40	40.0 x 40.0	1.6 x 1.6	Downlight	440-800
S55	55.0 x 55.0	2.2 x 2.2		730-1300
S65	65.0 x 65.0	2.6 x 2.6		1100-2000
S95	95.0 x 95.0	3.7 x 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

Mechanical Characteristics (Continued)



ChromaLit Linear*

Dimension Designation	Dimensions L X W (mm) ¹	Dimensions L X W (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*

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

*Product performance based on reference design. Product specifications subject to change

1. Typical dimension tolerances for length, width, and diameter are $\pm 0.2\text{mm}$

2. Typical lumen output is estimated based on typical blue LED radiometric watts recommended

Additional Mechanical Characteristics

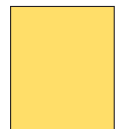
Characteristic	Value
Thickness	2.1mm $\pm 0.1\text{mm}$
Substrate	Polycarbonate
Orientation	Glossy side out, Matte side facing LED
Coefficient of Thermal Expansion	$7 \times 10^{-5}/^{\circ}\text{C}$
Off-State Color (Glossy side, representation using PANTONE color match system)	PANTONE 7403 (2700K 90 CRI) PANTONE 129 (3000K 80 CRI) PANTONE 106 (4000K 80 CRI) PANTONE 602 (5000K 70 CRI)

ChromaLit products ship with a laminated protection tape on the non-phosphor side of the product. Remove blue protection tape before use.

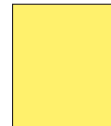
Off-State Color



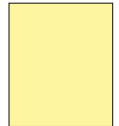
PANTONE 7403
(2700K)



PANTONE 129
(3000K)



PANTONE 106
(4000K)



PANTONE 602
(5000K)

Maximum Ratings

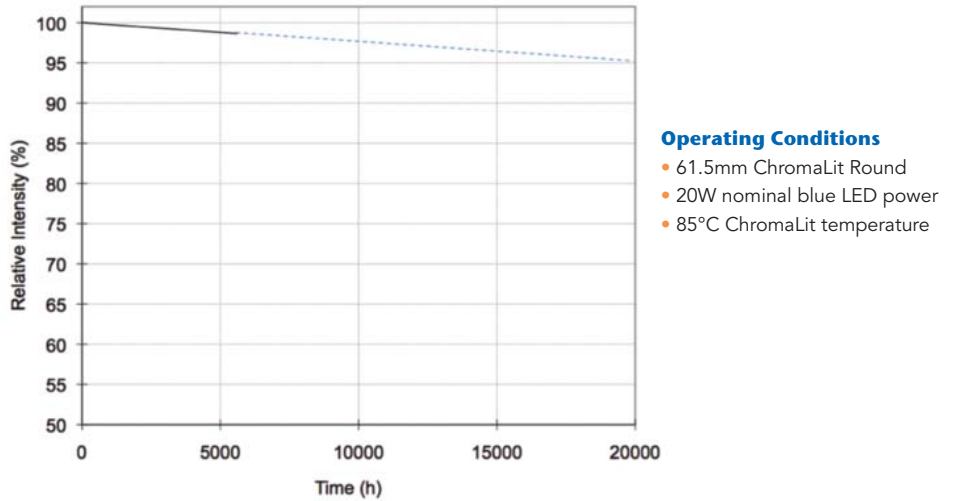
Description	Maximum Value
Maximum operating temperature	95°C
Minimum operating temperature	-40°C
Max storage temperature	95°C
Minimum storage temperature	-40°C

Reliability Data

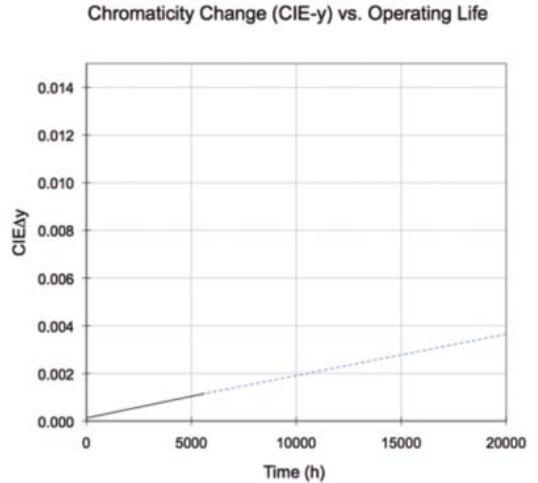
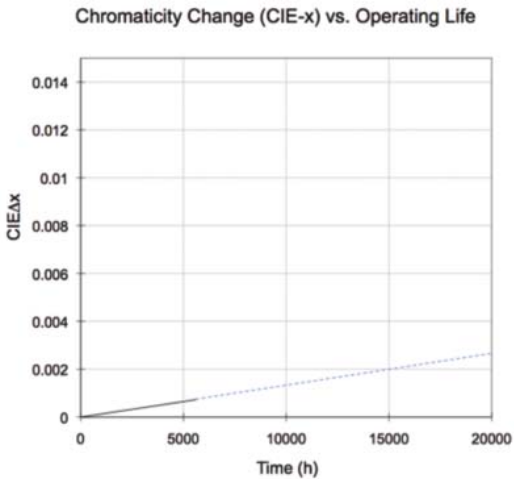
Typical Values

Description	Typical Values
Lumen maintenance	L70 50K hours at 85°C
Storage life	50K hrs
Storage humidity (non-condensing)	90%

Lumen Maintenance vs. Operating Life



Chromaticity Change vs. Operating Life



Handling Considerations

As a dirty or damaged phosphor layer could result in alteration in product performance, ChromaLit light sources 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.

Please contact a sales representative to request a demonstration kit and for full product details. For more information contact ChromaLit@Intematix.com or ChromaLit Hotline at 855-ChromaLit.

Company Information

Intematix Corporation is a materials development innovator, providing customizable, patented phosphors that serve as the foundation for high quality, energy efficient LED light. Intematix products enable attractive, vivid color quality, superior consistency, uniformity and stability. Headquartered in Fremont, California, Intematix maintains R&D, manufacturing, business and support operations in the United States, Asia and Europe.

To learn more about the company, please visit www.intematix.com

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