

















Illumination









A comprehensive portfolio of application optimized LUXEON LEDs and the infinitely configurable Matrix Platform








High Power LEDs - Industry leading flux, efficiency and design flexibility

PRODUCT	DESCRIPTION	FEATURES AND BENEFITS
LUXEON Rebel 	Proven reliable, 4530 high-power LED that gives you the design flexibility and performance you need	<ul style="list-style-type: none"> Specified CCT & CRI combinations ANSI-compliant Quarter binning]Exceeds ENERGY STAR® lumen maintenance requirements High efficacy for sustainable design More light delivered at operating temperature Recognized under the Component Recognition Program of Underwriters Laboratories Inc. UL listing E32743
LUXEON Rebel PLUS 	Proven reliable, hot-tested at 85°C, this 4530 high-power LED offers color consistency at 80CRI for a range of CCTs.	<ul style="list-style-type: none"> 3 and 5-step MacAdam ellipse: Freedom from Binning for superior quality of light Ability to deliver high lm/\$ for indoor applications Low typical V_f ~2.8V Small optical source size Full range of CCTs in 80CRI minimum LM-80 test report available
LUXEON Rebel ES 	Tested and binned at 700mA, this high-power package is more efficient for 4100K and 5650K applications.	<ul style="list-style-type: none"> High lm/\$ for cost competitive applications Broad portfolio of emitters for indoor and outdoor applications CCT and CRI combinations to support a wide range of applications Extensive applications ecosystem for easy design-in and quick ROI LM-80 test report available
LUXEON Z 	At 1.3mm x 1.7mm, it is perfect for use in close-packed applications requiring an undomed solution. Performance specified at 500mA and $T_j = 85^\circ\text{C}$	<ul style="list-style-type: none"> 1.3mm x 1.7mm micro footprint enables a high degree of design flexibility Undomed design allows precise optical control 1A max drive current allows for more flux per LED 3- and 5-step MacAdam ellipse color binning for superior Quality of Light
LUXEON Z ES 	Extreme flux density in a micro footprint package for precise optical control. Product performance at 700mA and 350mA, $T_j = 85^\circ\text{C}$.	<ul style="list-style-type: none"> Micro footprint enables close packaging Undomed design allows precise optical control 3- and 5-step MacAdam ellipse: Freedom from Binning enabling color consistency LM-80 test report available
LUXEON HL1Z 	Offers high-flux density performance in a compact footprint, enabling elegant and superior luminaire designs.	<ul style="list-style-type: none"> Small package size (1.4 x 1.4 x 0.36 mm) allows closely packed arrays for narrow beam spots Enables color mixing in CCT tunable applications High current densities for high lumen output and lm/\$ at high lm/W CSP 1mm² with 2 pads for direct attach enables ease of assembly Surface emission only for directional lighting without side light leakage High package densities
LUXEON HL2Z 	2mm square CSP-based, high power, undomed emitter designed to provide leading flux density, superior color consistency, high luminance and extreme flexibility in lighting solutions.	<ul style="list-style-type: none"> Undomed source makes it easier to increase optical efficiency and to realize narrow beam angles CSP die technology enables high efficacy and high driving current capability in unique applications Reliable and proven package with color consistency enabling close packaging, with superior beam Performance DLC R9 enabled to offer best-in-class color quality for luminaires
LUXEON HL2X 	This high-power, domed emitter for outdoor and industrial applications. Standard 3535 package with 3-stripe footprint delivers superior output, efficacy, and color stability.	<ul style="list-style-type: none"> Most usable light in application with a design emphasis on Beam Angle, Field Angle, Color Over Angle, and Optical Efficiency performance CSP die technology enables high efficacy and high driving current capability in unique applications Industry standard 3535 package with 3-stripe footprint and radiation pattern matched to LUXEON TX for ease of design DLC R9 enabled to offer best-in-class color quality for luminaires Offered in two different Luminous Flux Performance categories for customer flexibility in design and application



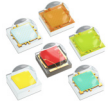






<p>LUXEON HL4Z</p> 	<p>A high-power , high-luminance emitter that delivers industry leading efficacy and lumen output from a 2.16mm x 2.16mm light emitting surface in a standard 3535 undomed package.</p>	<ul style="list-style-type: none"> • Industry standard 3535 package with a 3-stripe footprint, offers the flexibility of design and ease of use and enables faster design-in/time to market • Meets or exceeds requirements for applications that require maximum light output, excellent efficacy, superior color consistency, and reliability you can count on, such as stadium lighting, floodlighting, etc. • Highest lumens per emitter on smallest LES , enable the system design with the highest lumen density. • Package design enables solutions to minimize energy use and generated heat. • High drive current enables output to be maximized and LED count minimized. • Large thermal pad allows high drive currents and makes it possible to create close-packed LED clusters. • Full range of reliability testing, with LM-80 in progress. Peace of mind with a proven, robust package designed for outdoor and indoor/industrial use. • Multiple CCT-CRI offerings (CCT:2200K-6500K / 70,80,90CRI)
<p>LUXEON HL4X</p> 	<p>A high-power directional emitter designed for outdoor and industrial applications with maximized lumen output and ability to sustain maximum drive current at 4A.</p>	<ul style="list-style-type: none"> • Industry standard 3535 package with a 3-stripe footprint, offers the flexibility of design and ease of use and enables faster design-in/time to market. • Meets or exceeds requirements for applications that require maximum light output, excellent efficacy, superior color consistency, and reliability you can count on, such as stadium lighting, floodlighting, etc. • Package design enables solutions to minimize energy use and generated heat • Unique dome design is optimized to maximize light output within $\pm 130^\circ$ angle • High drive current enables output to be maximized and LED count minimized • Large thermal pad allows high drive currents and makes it possible to create close-packed LED clusters. • Full range of reliability testing, with LM-80 in progress. Peace of mind with a proven, robust package designed for outdoor and indoor/industrial use • Multiple CCT-CRI offerings (CCT:2200k-6500k / 70,80,90CRI). • Offers a wide range of applications and design usage capabilities for system designers with multiple selections of CCT/CRI.
<p>LUXEON MZ</p> 	<p>Undomed for tighter beam control and higher punch with identical solder footprint to LUXEON M. Product performance at 700mA and 1400mA, $T_j = 85^\circ\text{C}$. 70-80-90CRI, 3V, 6V and 12V.</p>	<ul style="list-style-type: none"> • Undomed package for improved punch and exceptional luminance • Common footprint as LUXEON M for compatibility with existing designs • Industry leading 1.2V package delivers exceptional efficacy • Leading thermal resistance enables flexible system design to optimize for $\text{lm}/\\$ and lm/W • Exceeds ENERGY STAR® lumen maintenance requirements
<p>LUXEON MX</p> 	<p>Delivers leading luminous flux, efficacy and optically compatible with LUXEON M. Product performance at 700mA and 1400mA, $T_j = 85^\circ\text{C}$. 70-80-90CRI, 6V and 12V.</p>	<ul style="list-style-type: none"> • 2000 lumens at 130 lm/W enables cost effective 100 lm/W fixtures. • 1200 lumens at 150 lm/W enables high performance 120 lm/W fixtures. • Double the flux vs. comparable emitters in 120 lm/W systems. • More robust package for improved reliability at higher drive currents. • Same footprint and optically compatible with LUXEON M for an instant upgrade.
<p>LUXEON 5050</p> 	<p>Multi-die high power package with extreme robust package design and efficacy of 200 lm/W. 70-80-90 CRI, hot color targeted and available in Round (6V, 24V), Square (6V, 30V), and HE/HE Plus (6V, 24V) versions with Industrial standard 5050 footprint.</p>	<ul style="list-style-type: none"> • Superior lm/W enables outstanding efficacy in end application. • Extremely reliable package design affirms long lifetime in harsh environments. • Robust coating design for enhanced sulfur protection capability (LUXEON 5050 Square LES). • Three voltage configurations (6V, 24V, and 30V) are compatible with low-cost high efficacy drivers. • Low Rth enables effective thermal dissipation design for higher efficiency • Hot-color targeting ensures color is within ANSI bin at 85°C. • 3-step and 5-step MacAdam ellipse binning structure ensures excellent color uniformity.
<p>LUXEON 7070</p> 	<p>Exceptionally robust with output >1500lm and efficacy > 190 lm/W. Hot tested, 70-80-90CRI and a full range of CCTs. Performance at 700mA, $T_j = 25^\circ\text{C}$ Flux and $T_j = 85^\circ\text{C}$ for R9 and CRI.</p>	<ul style="list-style-type: none"> • Superior lm/W enables outstanding efficacy in end application • Extremely reliable package design affirms long lifetime in harsh environments • Low Rth enables effective thermal dissipation design for higher efficiency • Hot-color targeting ensures color is within ANSI bin at 85°C • 3-step and 5-step MacAdam ellipse binning structure ensures excellent color uniformity • Offered in different voltage options for customer design flexibility



Mid Power White - A broad selection of high performance, reliable white LEDs

PRODUCT	DESCRIPTION	FEATURES AND BENEFITS
LUXEON 2835 Architectural 	Designed for demanding indoor applications. 1/9th micro bins 2, 3, 4, and 5-step SDCM, 3V, 6V, 9V options and full CCT and CRI options.	<ul style="list-style-type: none"> • Various configurations of voltage and die count to meet a wide range of application requirements • Industry standard footprint for drop-in replacement designs • Maximum drive current of up to 240mA allows for reduction of LED count • 6V and 9V hot-color targeting and 1/9th micro-color binning enable tight color control • 3-, 4- and 5-step MacAdam ellipse color kits available
LUXEON 2835 Commercial 	Designed to be the price/performance leader for commercial indoor lighting solutions when lumens per Watt and lumens per dollar are the driving metrics for development.	<ul style="list-style-type: none"> • Complete CCT/CRI offering for various application • Industry standard footprint for drop-in replacement • Reliable package design for commercial applications • 3 and 5 SDCM MacAdam ellipse enables precise color control
LUXEON 2835 Commercial Deep Dimming 	The mid-power product with Deep Dimming capability ensures that your fixtures and installations remain uniform when dimming the current levels to 1% of the typical current or less	<ul style="list-style-type: none"> • Dedicated deep dimming bin achieves best-in-class dimming effects at 1% dimming current • 0.05 VF range by default, free customer from complex driver compatibility design • Industry standard footprint for drop-in replacement designs • Complete CCT/CRI offering for various application • Reliable package design for commercial applications that prioritize lumens per Dollar and lumens per Watt • 3 & 5-step MacAdam ellipses enable precise color control
LUXEON 2835 with CrispColor Technology 	The perfect 2835 mid-power LED for fashion retail lighting highlighting rich color and increasing contrast. CrispColor technology brings fabrics and textures to life.	<ul style="list-style-type: none"> • Industry standard footprint for drop-in replacement designs • Maximum drive current of up to 240mA allows for reduction of LED count • 3- and 5-step MacAdam ellipse color kits available
LUXEON 2835 with FreshFocus Technology 	Bring out reds for greater visual appeal to meat, or breads and pastries. Emphasizes the natural colors of fish and gives that “just picked” appearance to produce.	<ul style="list-style-type: none"> • Spectrum engineered products with focused color points to enable the right lighting for specific merchandise and application • Industry standard footprint for drop-in replacement designs • Maximum drive current of up to 240mA allows for reduction of LED count • IR and UV free, which keeps the merchandise fresher longer and prevents meat discoloration • 3- and 5-step MacAdam ellipse color kits available
LUXEON 3014 	Compact package: 3.0mm x 1.4mm x 0.7mm—is ideal for achieving uniform light output where space is limited. Hot-color targeted at a junction temperature of 65°C.	<ul style="list-style-type: none"> • Compact package design affirms uniformity and reduction in spottiness • Hot-color targeting ensures better color control • 1/9th ANSI micro-color binning enables tight color control • 120mA maximum driving current allows outstanding brightness
LUXEON 3014 with FreshFocus Technology 	Compact package: 3.0mm x 1.4mm x 0.7mm. FreshFocus Technology spectrum highlights food items.	<ul style="list-style-type: none"> • Highest flux densities with industry's smallest Light Emitting Surface (LES) • 3-step MacAdam ellipse color definition: Freedom from • Binning for color consistency from luminaire to luminaire • Up to 4x lower thermal resistance than competition, enabling smaller heatsinks and higher lumens • Supported by a comprehensive optical, mechanical and electrical ecosystem
LUXEON 3020 	Hot-color targeted EMC-based 3.0mm x 2.0mm package, delivers superior efficacy, lumen maintenance, and assurance of ANSI color compliance at operating conditions of 85°C.	<ul style="list-style-type: none"> • High efficacy delivers superior lumen maintenance • Reliable package delivers superior thermal properties and reliability • 1/9th ANSI micro-color binning enables tight color control • Hot-color targeted at 85°C which leads to better color accuracy








<p>LUXEON 3030 2D</p> 	<p>This high flux, hot-color targeted to ensure color performance at application conditions of 85°C. 120mA, 6V surface-mount emitter solution.</p>	<ul style="list-style-type: none"> • 1/9th micro-color binning enables tight color control. • Superior luminous flux at max current for reduced LED count. • Hot-color targeting ensures that color is within ANSI bin at typical application conditions, 85°C. • Enables 3-, 4-, 5-step MacAdam ellipse custom binning kits.
<p>LUXEON 3030 2D Plus</p> 	<p>Exceptional luminous efficacy and cost efficiency within a robust 3030 6V package, and designed for outdoor and industrial lighting applications</p>	<ul style="list-style-type: none"> • 1/9th micro-color binning enables tight color control. • Superior luminous flux at max current for reduced LED count. • Hot-color targeting ensures that color is within ANSI bin at typical application conditions, 85°C. • Enables 3-, 4-, 5-step MacAdam ellipse custom binning kits. • Robust coating design for enhanced sulfur protection capability.
<p>LUXEON 3030 HE</p> 	<p>This go-to 3030 mid-power package delivers high flux and efficacy with proven robustness for linear and horticultural applications.</p>	<ul style="list-style-type: none"> • Broadband white light with <2%blue content – NightScape Technology • Superior high efficacy at rated current enables outstanding lm/W at the system level. • Reliable package design from a proven product line affirms long application lifetime. • Quadrant bin structure within 3 SDCM enables 2 SDCM by kitting. • Industry-standard package allows drop-in replacement for existing 3030 packages. • Robust coating for enhanced sulfur protection.
<p>LUXEON 3030 HE Plus</p> 	<p>Industry leading performance in 3030 3V package. The go-to solution when top flux and efficacy are required. Designed for indoor and outdoor with full CRI and CCT coverage and able to kit to 2 SDCM.</p>	<ul style="list-style-type: none"> • Broadband white light with <2%blue content – NightScape Technology. • Superior high efficacy at rated current enables outstanding lm/W at the system level. • Reliable package design from a proven product line affirms long application lifetime. • Quadrant bin structure within 3 SDCM enables 2 SDCM by kitting. • Industry-standard package allows drop-in replacement for existing 3030 packages. • Robust coating for enhanced sulfur protection (LUXEON 3030 HE Plus).
<p>LUXEON 3030 HE Plus Deep Dimming</p> 	<p>For dimming applications that require extremely uniform light output while dimming. Top notch lm/W performance, lifetime, and pure 3 SDCM color bin with 0.1 V_f width.</p>	<ul style="list-style-type: none"> • Dedicated Deep dimming bin achieves best-of-class dimming effects. • 3 SDCM color bin by default, eliminate customer concern on color consistency. • 0.1 V_f width by default, free customer from complex driver compatibility design. • Superior high efficacy at rated current enables outstanding lm/W at system level. • Reliable package design from a proven product line affirms long lifetime for end application. • Industry standard package allows drop-in replacement for existing 3030 packages.
<p>LUXEON 3030 HV</p> 	<p>High voltage, low current package compatible with more efficient and cost effective drivers. 1/9th micro-color binned for tight color control and hot-color targeted - 85°C.</p>	<ul style="list-style-type: none"> • High voltage at low current, compatible with more efficient and cost effective drivers. • 24V and 48V options available to optimize total voltage output. • 1/9th micro color binning and 85°C hot-color targeting enables tight color control. • EMC based package affirms lumen maintenance and long lifetime.
<p>LUXEON 3535L Line</p> 	<p>Broad flux and efficacy combinations and with full CCT and CRI options and a max drive of 200mA. Supports EnergyStar and DLC. 1/7th ANSI color binning delivers tight color control.</p>	<ul style="list-style-type: none"> • Supports ENERGY STAR lumen maintenance certification requirements. • Meets DLC Premium requirements. • Maximum drive current of 200mA delivers superior lumens for reduced LED count. • 1/7th ANSI color binning delivers tight color control. • Enables T_s points of 105°C, which allows for higher board temperature. • Full range of CCTs and CRI configurations for design flexibility. • UL-recognized component [E352519].

Color LEDs - A complete color spectrum for a variety of architecture and entertainment applications









PRODUCT	DESCRIPTION	FEATURES AND BENEFITS
LUXEON HL1Z Color Line & Fusion 	A CSP LEDs that support high output with low current. The small package size of 1414 helps with design in a solution for a constrained space.	<ul style="list-style-type: none"> • Small package size (1414) allows colored spots with small beam angles from a minimal Light Emitting Surface (LES). • Supports high power density with up to 2W electrical power per LED. • Superior color stability over temperature with phosphor-converted saturated color LEDs. • Complementary to the LUXEON HL1Z white LED series
LUXEON Rebel Color Line 	Ideal for a wide variety of lighting, signaling, signage, and entertainment applications. 10 colors in a proven 350mA package.	<ul style="list-style-type: none"> • Full color palette for a wider spectrum range • Highest efficacy available for colors, allowing for lower power consumption • High flux and leading hot and cold performance for saturated colors • Fully developed ecosystem for LUXEON Rebel platforms
LUXEON C ES Color Line 	Design Powerful, complex multi-color arrays with minimal LED-to-LED spacing.	<ul style="list-style-type: none"> • Best in class for multi-color array mixing with minimum LED-to-LED spacing needed for placement • The 3-stripe footprint, offers the flexibility of design in a complex routing as it shortened electrodes for routing between LEDs while keeping LEDs maximally close-packed • Large die in a small package provides high flux, low Vf, and low Pthermal • High drive current enables output to be maximized and LED count minimized • Large thermal pad allows high drive currents and makes it possible to create close-packed LED clusters • Superior reliability from a proven, robust package
LUXEON C Color Line 	Designed for flawless color mixing with a single focal length. 14 colors plus white CCTs 2200K to 6500K and 70 to 90 CRI.	<ul style="list-style-type: none"> • One focal length allows flawless color mixing, maximum optical efficiency and removes halos • Low dome design eliminates trade-offs between flux and source size • Hot tested—removes guesswork for designers • Industry's lowest thermal resistance means greater light output and lower heatsink costs • Small symmetrical 2x2mm² package enables dense packing and limits the impact of rotation during reflow
LUXEON CZ Color Line 	Undomed 2.0mm x 2.0mm package for maximum flexibility and color mixing . 14 colors plus white CCTs 2200K to 5700K and 70 to 90 CRI.	<ul style="list-style-type: none"> • Small and symmetrical 2x2mm² package • Industry leading Hot/Cold Factors and the lowest thermal resistance • Maximized punch (cd/lm)
LUXEON Rubix 	High drive, up to 3A, in a tiny, undomed 1414 package is the ultimate choice for flexibility and punch in color applications. 7 different colors plus white.	<ul style="list-style-type: none"> • Tiny footprint 1414 package • High Drive current up to 3 Amps DC • Maximized punch (cd/lm)
LUXEON Z Color Line 	2.2mm ² , undomed compact design. 10 colors from deep red to royal blue. Performance tested at 500mA, T _j = 25°C and T _j = 85°C	<ul style="list-style-type: none"> • Broad selection spanning 440–670nm, including a unique Lime color • 1.3mm x 1.7mm footprint enables unique arrangements in space constrained applications • 4-up RGBW pixel in 9.5mm² — four colors in less area than one regular high power color emitter • Undomed design allows better optical management • Enables customizable light sources: linear, rectangular, circular
LUXEON 2835 Color Line 	13 colors plus 3 whites in an efficient 2835 mid-power package. Perfect for a wide range of indoor and outdoor applications.	<ul style="list-style-type: none"> • Single die and single source architecture for optical control • Full color palette for a wider spectrum range
LUXEON 3535L Color Line 	Seven colors in a standard 3535 package tested at 100mA, T _j = 25°C. Same focal length as LUXEON Rebel and LUXEON Z.	<ul style="list-style-type: none"> • Industry standard package enables drop-in replacement for existing 3535 packages • Single die and single source architecture for optical control • Common focal length with LUXEON Rebel and LUXEON Z Color LEDs • Full color palette for a wider spectrum range





<p>LUXEON 3528 RGB</p> 	<p>This slim package is only 1.75mm high, can manage 0.5W of power, and has an IPX8 water resistance rating. The white package is suitable for indoor and outdoor applications.</p>	<ul style="list-style-type: none"> • RGB 3-in-1 module • Compact size – just 3.5mm x 2.8mm x 1.75mm is perfect for linear, flexible, and shaped applications • Individually control each channel • IPX8 water resistant rating
<p>LUXEON 5052 RGBW</p> 	<p>Make color tuning easier with this 4-in-1 RGBW package. Choose Blue or Royal Blue and a white with CCT from 2200K to 6500K. Product performance tested at 120mA, $T_j = 25^\circ\text{C}$.</p>	<ul style="list-style-type: none"> • RGBW 4-in-1 module • 5.0mm x 5.2mm • Individually control each channel

Horticulture - LEDs engineered to deliver the precise wavelengths of light needed to improve crop yield






PRODUCT	DESCRIPTION	FEATURES AND BENEFITS
<p>LUXEON SunPlus 20 Line</p> 	<p>The 2.0mm² package is available in Far Red, Deep Red, Royal Blue, Lime, and Cool White, with viewing angles of 120° and 150°. Product performance is at 350mA, $T_j = 85^\circ\text{C}$.</p>	<ul style="list-style-type: none"> • 120° and 150° viewing angle of choice for various design needs • 2.0mm x 2.0mm package footprint
<p>LUXEON SunPlus 2835 Line</p> 	<p>Binned and tested based on Photosynthetic Photon Flux (PPF) color options include Purple (2.5% to 25% Blue), Horticulture White, Far Red, Deep Red, Royal Blue, and Lime.</p>	<ul style="list-style-type: none"> • 120° angle for uniform light distribution for greenhouse, vertical farming and interweaving applications • 2.8mm x 3.5mm package
<p>LUXEON SunPlus 35 Line</p> 	<p>Binned and tested based on Photosynthetic Photon Flux (PPF) color options include Purple (2.5% to 25% Blue), and Lime. Product performance is at 100mA, $T_j = 85^\circ\text{C}$.</p>	<ul style="list-style-type: none"> • 3.5mm x 3.5mm package footprint
<p>LUXEON SunPlus CoB Line</p> 	<p>LUXEON SunPlus CoB Line includes three different LES sizes: 15mm, 19mm, and 32mm. Available in Purple (12.5% Blue) and Rose. Typ. PPF ($\mu\text{mol/s}$) in PAR (400 to 700nm) is 53 to 200.</p>	<ul style="list-style-type: none"> • 115° angle for directional light distribution for greenhouse applications • Deal solution for more directional horticulture applications that require a high light output and wattage
<p>LUXEON SunPlus HPE</p> 	<p>With an industry-standard footprint of 3.5mm x 3.5mm. LUXEON SunPlus HPE is a deep red High Power LED with a peak wavelength of 660nm, the best in class performance and efficacy for horticulture applications.</p>	<ul style="list-style-type: none"> • High power deep red ceramic LED with 660nm peak wavelength • High PPF and PPE specified at 25°C and 85°C • Industry standard footprint 3.5mm x 3.5mm
<p>LUXEON SunPlus 3030</p> 	<p>Widely available, this top performing broad-spectrum white light delivers top rated $\mu\text{mol/J}$ and PPF ($\mu\text{mol/s}$) performance and long lifetime with CCTs ranging from 2200K to 6500K.</p>	<ul style="list-style-type: none"> • 3.0mm x 3.0mm package footprint • Top rated $\mu\text{mol/J}$ and PPF ($\mu\text{mol/s}$) performance • Ideal solution for horticulture applications that utilize broad-spectrum white light
<p>LUXEON SunPlus 5050</p> 	<p>Three versions, Round, Square, and HE, 6-30V options, and a package designed for harsh environments make this a perfect choice for horticulture applications.</p>	<ul style="list-style-type: none"> • Top-rated $\mu\text{mol/J}$ and PPF ($\mu\text{mol/s}$) performance • Extremely reliable package design affirms long lifetime in harsh environments

CoBs - High performance CoB solutions that optimize system design





PRODUCT	DESCRIPTION	FEATURES AND BENEFITS
LUXEON CoB Core Range 	Reliable and efficient options for the widest range of applications. 5 PCB sizes, 8 LES sizes from 6.5 to 32.8 mm. 2200K to 6500K CCT, 70 to 95 CRI. Standard and PW color spaces.	<ul style="list-style-type: none"> • Highest flux with the industry's smallest LES • 2 or 3-step MacAdam ellipse color definition: Freedom from Binning for color consistency from luminaire to luminaire • Lowest thermal resistance, enabling smaller heat sinks and higher lumens • Supported by a comprehensive optical, mechanical, and electrical ecosystem
LUXEON CoB Core Pro 	LES sizes of 9, 13, 15 and 19 at 3000K make for a very high efficacy and excellent quality of light option that makes colors pop.	<ul style="list-style-type: none"> • Best in class efficacy and superior color quality • Multiple LES sizes and flux output that fit different applications and requirements • Superior thermal resistance enables the use of smaller heatsinks and prolonged product life span • Supported by a comprehensive optical, mechanical, and electrical ecosystem
LUXEON CoB Core Range High Density Gen 2 	Double the flux in the same form factor. Focus on achieving the highest Center Beam Candle Power. 6, 9, and 11mm LES.	<ul style="list-style-type: none"> • Highest flux densities with smallest LES • 3-step MacAdam ellipse color definition: Freedom from Binning for color consistency from luminaire to luminaire • Superior thermal resistance enabling smaller heatsinks and higher lumens • Supported by a comprehensive optical, mechanical and electrical ecosystem
LUXEON CoB Core Range PW 	Built for applications that need the highest quality of light combined with market leading performances. Beautiful color transforms areas into vibrant spaces. LES from 9 to 19mm.	<ul style="list-style-type: none"> • High efficacy and superior color quality at lower energy consumption • Various LES sizes and flux outputs that fit different applications and requirements • Best-in-class thermal resistance enabling the use of smaller heatsinks and prolonged product life span • Supported by a comprehensive optical, mechanical, and electrical ecosystem
LUXEON CS CoB 	Industry standard square footprint enables easy design-in for new luminaire programs and a cost-effective replacement for existing solutions where an upgrade is desired.	<ul style="list-style-type: none"> • Widely used square footprints for easy design-in • High performance with superior color stability • Low thermal resistance enables smaller heatsinks and extends the operating life span • Supported by a comprehensive optical, mechanical, and electrical ecosystem
LUXEON CS Pro CoB 	With spectra tailored to retail lighting, the CS Pro CoBs are easy to design-in and are a cost-effective replacement for solutions where superior quality of white light is required	<ul style="list-style-type: none"> • Widely used square footprints for easy design-in • High performance with superior color stability • Low thermal resistance enables smaller heatsinks and extends the operating life span • Supported by a comprehensive optical, mechanical, and electrical ecosystem
LUXEON CX Plus CoB Gen2 	Industry standard footprint. LES of 6, 9, 12, 14mm. CCT 2700K to 5000K and CRI of 80 and 90. Easy design-in.	<ul style="list-style-type: none"> • Higher efficacy to benefit luminaire design • An immediate, effortless upgrade to existing designs currently using legacy CoBs with a square footprint • MCPCB substrate that enables more robust systems than ceramic substrate • 2- and 3-step MacAdam ellipse ensuring color consistency from luminaire to luminaire
LUXEON CX Plus CoB High Density 	An industry standard footprint of 13.35mm ² , and LES of 4.5mm, 6mm, and 9mm. An effortless upgrade to higher flux and better value.	<ul style="list-style-type: none"> • Industry's smallest Light Emitting Surfaces (LES) for highest lumen densities • An immediate, effortless upgrade to existing designs using legacy CoBs with a square footprint • 2- and 3-step MacAdam ellipse ensuring color consistency from luminaire to luminaire

<p>LUXEON CX Plus CoB High Density (Below BBL)</p> 	<p>Impressive white color at 95CRI, 2- and 3-step MacAdam ellipse Below Black Body Line. Industry standard footprint of 13.35mm², and LES of 4.5mm, 6mm, and 9mm.</p>	<ul style="list-style-type: none"> • Industry's smallest Light Emitting Surfaces (LES) for highest lumen densities @95CRI • An immediate, effortless upgrade to existing designs using legacy CoBs with a square footprint • 2- and 3-step MacAdam ellipse ensuring color consistency from luminaire to luminaire
<p>LUXEON CS CoB with CrispWhite Technology</p> 	<p>Designated to retail lighting that makes an impact, revealing the whitest whites.</p>	<ul style="list-style-type: none"> • Spectral wavelength distribution that excites whitening agents • Enhanced white and color rendering • Widely used square footprints for easy design-in • High performance with superior color quality • Low thermal resistance enables smaller heatsinks and extends the operating life span • Supported by a comprehensive optical, mechanical, and electrical ecosystem
<p>LUXEON CoB with CrispColor Technology</p> 	<p>Special phosphor technology creates a higher gamut color rendering than existing solutions. A specific color point below the Black Body Line makes colors pop and fabrics come to life.</p>	<ul style="list-style-type: none"> • High performance with superior color quality • Low thermal resistance enables smaller heatsinks and extends the operating life span • 3-step MacAdam ellipse color definition: Freedom from Binning for color consistency from luminaire to luminaire • Supported by a comprehensive optical, mechanical, and electrical ecosystem
<p>LUXEON CoB with FreshFocus Technology</p> 	<p>FreshFocus Technology creates the most impactful lighting by accentuating the appeal of a variety of fresh food areas such as supermarkets, delis, butcher shops and bakeries.</p>	<ul style="list-style-type: none"> • Highest flux densities with industry's smallest Light Emitting Surface (LES) • 3-step MacAdam ellipse color definition: Freedom from Binning for color consistency from luminaire to luminaire • Up to 4x lower thermal resistance than competition, enabling smaller heatsinks and higher lumens • Supported by a comprehensive optical, mechanical and electrical ecosystem

Integrated Modules - Integrated Level 2 assemblies and LED light engines tailored to the most demanding requirements

PRODUCT	DESCRIPTION	FEATURES AND BENEFITS
<p>LUXEON XR-5050HE</p> 	<p>Standard integrated module with 8, 12, 16, and 24 LUXEON 5050 HE emitters delivers over 180 lm/w and up to 8600 lumens of highly efficient white light.</p>	<ul style="list-style-type: none"> • Efficacy and luminous flux of up to 191lm/W typical and 8600lm of output • Superior board level color control of $\leq 3\text{SDCM}$ • MCPCB for efficient heat dissipation and mechanical robustness • Designed and manufactured with dimensions aligned to Zhaga specifications • UL 8750, ENEC, ENEC+, CE, UKCA compliance • 5-year limited guarantee
<p>LUXEON XR-5050 Round</p> 	<p>8, 12 or 16 LUXEON 5050 Round LEDs on a MCPCB substrate, with electrical connectors. Easier system integration, faster time to market, and use with industry standard optics.</p>	<ul style="list-style-type: none"> • Efficacy and luminous flux of up to 184lm/W and 5700lm of output • Superior board level color control of $\leq 3\text{SDCM}$ • Compatible with standard third-party optics • Features LUXEON 5050 Round LEDs with industry-leading efficacy and lumens in multi-die, high power package • 5-year guarantee
<p>LUXEON XR-5050 SQR</p> 	<p>8, 12 or 16 LUXEON 5050 Square LEDs on a MCPCB substrate, with electrical connectors. Easier system integration, faster time to market, and use with industry standard optics.</p>	<ul style="list-style-type: none"> • Efficacy and luminous flux of up to 180lm/W and 5600lm of output • Superior board level color control of $\leq 3\text{SDCM}$ • Design compatible with standard third party optics • Features LUXEON 5050 Square LEDs with industry-leading efficacy and lumens in multi-die, high power package • 5-year guarantee
<p>LUXEON XR-HL2X</p> 	<p>Standard modules in 8-up, 12-up, and 16-up formats on MCPCB deliver more than 2800 lumens and 184 lm/w. Simplifies and speeds up luminaire design.</p>	<ul style="list-style-type: none"> • Efficacy and luminous flux of up to 184lm/W typical and 2800lm of output • CCT/CRI Options:3000K, 4000K (70 CRI) • Board level color control of $\leq 5\text{SDCM}$ • MCPCB for efficient heat dissipation and mechanical robustness • UL 8750, ENEC, CE, UKCA compliance • 5-year limited guarantee
<p>LUXEON XR-7070</p> 	<p>4 LEDs on an MCPCB deliver more than 5000 lm at 170 lm/W. Eliminates LED-assembly engineering costs, tooling costs, and material inventory costs while accelerating time-to-market.</p>	<ul style="list-style-type: none"> • Efficacy and luminous flux of up to 170lm/W typical and 5400lm of output • CCT/CRI Options: 2700K, 3000K, 3500K, 4000K, 5000K (70 & 80 CRI) • Superior board level color control of $\leq 3\text{SDCM}$ • MCPCB for efficient heat dissipation and mechanical robustness • UL 8750, ENEC, CE, UKCA compliance • 5-year limited guarantee

Human Centric Lighting



PRODUCT	DESCRIPTION	FEATURES AND BENEFITS
LUXEON Fusion 	<p>A single platform for Dim-to-Warm, Color Tuning, and Full-Output White light. 1800K to 10000K, CRI>90 and micro color tuning in one SKU.</p>	<ul style="list-style-type: none"> • Dim to warm capability • Dynamically tunable white lighting • Full freedom of white color selection and adjustment after fixture installation
LUXEON SkyBlue 	<p>The simplest, most efficient circadian lighting LED solution. Deliver superior at comfortable CCTs and minimize engineering costs.</p>	<ul style="list-style-type: none"> • Superior melanopic ratio, high-efficacy circadian LED lighting • Unmatched ease of use and time to market • Industry standard 3030 packaging allows simple design-in • Seamless connection between lighting specification, fixture performance and LED selection • Very high CRI, R9, and low Cyanosis Observation Index • Lighting uniformity within a 3 MacAdam ellipse color space
LUXEON 2835 Commercial Deep Dimming 	<p>The mid-power product with Deep Dimming capability ensures that your fixtures and installations remain uniform when dimming the current levels to 1% of the typical current or less.</p>	<ul style="list-style-type: none"> • Dedicated deep dimming bin achieves best-in-class dimming effects at 1% dimming current • 0.05 Vf range by default, free customer from complex driver compatibility design • Industry standard footprint for drop-in replacement designs • Complete CCT/CRI offering for various application • Reliable package design for commercial applications that prioritize lumens per Dollar and lumens per Watt • 3 & 5-step MacAdam ellipses enable precise color control
LUXEON 3030 HE Plus Deep Dimming 	<p>Consistent and uniform deep-dimming. 0.1 Vf width by default. Top lm/W performance, long lifetime, and pure 3 SDCM color bin.</p>	<ul style="list-style-type: none"> • Dedicated Deep dimming bin achieves best-of-class dimming effects • 3 SDCM color bin by default, eliminate customer concern on color consistency • 0.1 Vf width by default, free customer from complex driver compatibility design • Superior high efficacy at rated current enables outstanding lm/W at system level • Reliable package design from a proven product line affirms long lifetime for end application • Industry standard package allows drop-in replacement for existing 3030 packages

NightScape Technology



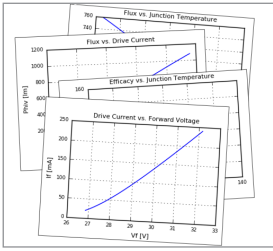
NightScape Technology is the first white light to significantly reduce the percent of blue content between 400nm and 500nm to less than 2%. Through thoughtful luminaire design, control technologies, and lighting designs that don't 'over-illuminate' are necessary, it is now possible, thanks to advances in LED technology, to start with the right light for night-time illumination.

NightScape Technology will first be available in Lumileds LUXEON 3030 HE Plus and 5050 Square LEDs with a CCT of 1900K and blue light content of just 1.8% in the 400-500 nanometer range of the visible light spectrum. These outdoor proven emitters are widely used around the world for outdoor lighting including streetlights, pedestrian, landscape, and similar applications. Over time, the technology can be applied to virtually any of Lumileds white LED lines to meet the lighting community's needs.

PRODUCT	BLUE CONTENT	NOMINAL CCT	TYPICAL FLUX (lm)	TYPICAL EFFICACY (lm/W)	TEST CURRENT (mA)	FORWARD VOLTAGE
LUXEON 3030 HE Plus w/ NightScape 	<2%	1900K	32.6	185	65	2.71
LUXEON 5050 Square w/ NightScape 	<2%	1900K	695	142	800 160	6.1 30.5

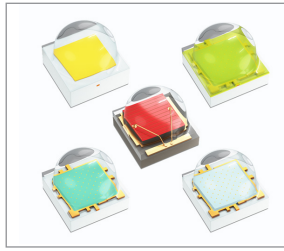
For more information about NightScape Technology or to request samples, please email NightScape@Lumileds.com.

TYPICAL LED PERFORMANCE



Visualize typical LED performance curves (IV chart, flux vs. temperature, ..) – convert the Lumileds testing/binning conditions to your use case conditions.

LED SPECTRUM MIXER



Compute and optimize the spectrum produced by one or a combination of multiple (different) LEDs. Moreover, the tool offers a convenient way for downloading LED spectra.

LED SYSTEM CALCULATOR



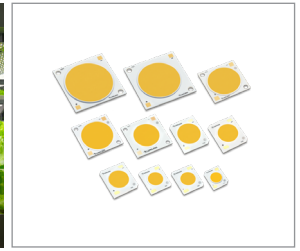
Perform calculations on entire LED systems (LEDs + heatsink + driver) to project crucial optical, electrical, and thermal performance parameters in your intended application.

HORTICULTURE CALCULATOR



Compute and optimize the parameters relevant to horticulture applications for a single LED or for a combination of LEDs.

COB SELECTION TOOL



Search the LED database for suitable CoB products. You can specify static properties such as color and package geometry as well as dynamic parameters such as the target flux at designated operation condition.

Please check out our ecosystem support at lumileds.com/designtools.

About Lumileds

Lumileds is a global leader in LED and microLED technology, innovation, and solutions for the automotive, display, illumination, mobile, and other markets where light sources are essential. Our approximately 3,500 employees operate in over 15 countries and partner with our customers to deliver never before possible solutions for lighting, safety, and well-being.

To learn more about our lighting solutions, visit lumileds.com.



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