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Studio / Film / Inspection / Food Shop / Luxury Store
JIS-AAA / TM-30-15 / ISO3664 High CRI LED Solution
(LED Package / LED COB / LED Lighting)

Almost Same Spectrum with Sunlight!

Non-UV(Ultra Violet) LED Chip
Non-Remote Phosphor
Non-Greenish Tint (On Camera Display)
CRI>95Ra, R1~R15 (All Factor) > 90

GLBTECH

INTRODUCTION

About GLBTECH

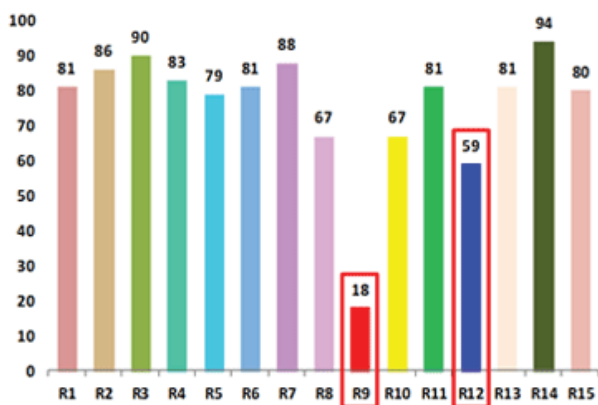
We are a developer and manufacturer of LED package, COB and lighting products of green growth industry and leading High CRI LED market. We contribute to our partner's success by providing High CRI customized LED solution for their satisfaction from LED package for broadcast, inspection, luxury Store, Food Shop applications to premium indoor and outdoor LED lighting products.

What is RaMax ?

RaMax, a GLBTECH High CRI LED product brand, means maximizing values of each color from R1 to R15 of CRI. The higher the CRI from R1 to R15, the more natural the colors appear so the lighting with High CRI is recognized as the best lighting because it protects sight by easing eye strain and reproduces exact color. Now, GLBTECH has a technology that realizes the world's best CRI and will lead global High CRI LED market with our RaMax brand.

RaMax Products realize the World's Best CRI from R1 to R15. The average CRI from R1 to R8 is typical 98Ra and from R1 to R15 is typical 95 in Cool and Warm White. In addition, they have a TLCI (Television Lighting Consistency Index) of 98 and this measure is a important reference for film, TV and photography lighting industries.

RaMax LED CRI Comparison



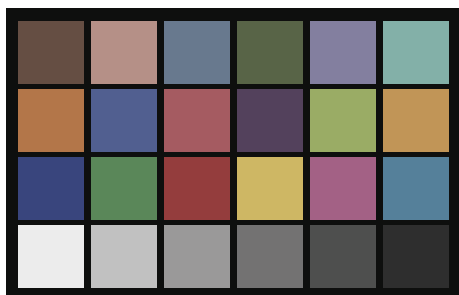
General White LED CRI Values



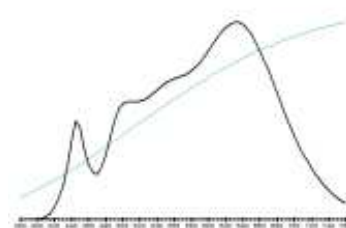
GLBTECH White LED CRI Values

TLCI 2012 Data File

TLCI - 2012 : 98 (CCT:3200K)



Sector	Lightness	Chroma	Hue
R	0	0	0
R/Y	0	0	+
Y	0	0	0
Y/G	0	0	0
G	0	0	0
G/C	0	0	0
C	0	0	0
C/B	0	0	+
B	0	0	0
B/M	0	0	+
M	0	0	+
M/R	0	0	0



— GLBTECH LED Spectrum
— Halogen Lamp Spectrum

RaMax Technology

RaMax Advantages

- Global Top General CRI (R1~R8: 97~99Ra)
- Global Top Special CRI (R9 & R12: Typ. 95)
- McAdam 3step Color Control
- Wide CCT Control (2500K~7000K)
- Significantly lower price than the competitors
- The highest efficiency of the High CRI LED products
- Long lifespan (5 years warranty)
- Environment-friendly (UV free, Pb free and RoHS Compliance)

Global High CRI Technology Comparison

항목	HID	Halogen	GLBTECH	Company "X"	Company "Y"
Efficiency (lm/W)	50~57lm/W	10~17lm/W	90~140lm/W	42~52lm/W	65~75lm/w
Color Temp. (K)	3,000~4,000	2,500~3,050	2,500~7,500	2,700~4,000	2500~5000
CRI (R1~R8) Avg. (Ra)	81/92	99	98	96	95
R9	-	99	97	92	94
R12	-	99	95	88	92
CRI (R9~R15) Avg. (Ra)	-	99	95	92	93
Life Time (Hours)	10,000~12,000	3,000~6,000	50,000	50,000	50,000
Cost	N/A	N/A	100%	230%	580%
Technical Methods	High Intensity Discharge	Halogen Lamp	Blue chip + Phosphor	White LED PKG+ Phosphor Sheet	UV chip + Phosphor
Goods	LAMP	LAMP	PKG, COB Module	COB Module	PKG, COB Module
RoHs	Non-Free	Non-Free	Free	Free	UV Non-Free
TLCI	N/A	98	98	N/A	N/A

RaMax LED TM - 30 - 15 Comparison

- TM-30-15 is concept of the Integrated Standard with Color Rendering and Color Reproduction

CRI & TM-30-15		Color Vector Graphic		Color Distortion Graphic		CRI & TM -30-15		Color Vector Graphic		Color Distortion Graphic	
CCT	4000K					CCT	4000K				
CRI-Ra	83					CRI-Ra	97				
CRI-R9	18					CRI-R9	96				
TM-Rf	77					TM-Rf	96				
TM-Rg	101					TM-Rg	103				

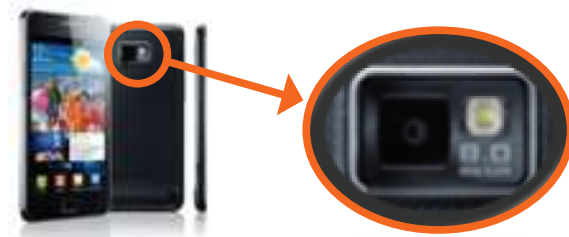
General White LED TM-30-15 Values

GLBTECH White LED TM-30-15 Values

RaMax Technology

RaMax Applications

- Smartphone Flash LED Solution



Normal Flash LED
(85 Ra)

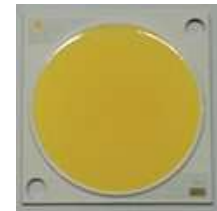


RaMax Flash LED
(98 Ra)

- Studio / Film LED Lighting Solution



750W
Halogen Lamp



150W
RaMax LED COB

- Auto Car Painting Inspection LED Lighting Solution



High CRI Fluorescent lamp
D50, D65, 42W
(97Ra, R1-R15 All>90)



High CRI LED Tube
5000K, 6500K, 24W
(97Ra, R1-R15 All>90)

- Food Shop / Luxury Store LED Lighting Solution



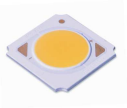
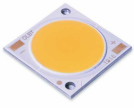
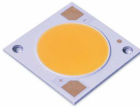

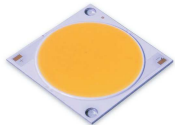
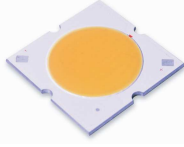
Fluorescent lamps
(64 Ra. 1200 lux)



RaMax LED Tube
(96 Ra. 1700 lux)

GLBTECH Products Lineup

		Top - View LED				Side - View LED	
Model							
		5630_1.0T	3030_1.2T	3535_1.2T	5050_1.0T	3528_1.4T 5050_1.1T	3810_0.6T
Frame		Slug 4pin	Slug 2pin	Slug 2pin	Slug 2pin	Forming 6pin	Forming 2pin
CRI typ. (Ra)	Ultra	97 ~ 98	97 ~ 98	97 ~ 98	97 ~ 98	RGB	Possible
	Entry	92 ~ 93	92 ~ 93	92 ~ 93	92 ~ 93		
Operating Power		0.2W	0.2 ~ 0.5W	0.2 ~ 1.0W	0.2 ~ 2.0W	0.1 ~ 1.0W	0.1W

		LED COB					
Model							
		1712_2.0T	1916_2.0T	2821_2.0T	3026_2.0T	3833_2.0T	4232_3.5T
Frame		Al PCB 2pin	Al PCB 2pin	Al PCB 2pin	Al PCB 2pin	Al PCB 2pin	Al PCB 2pin
CRI typ. (Ra)	Ultra	97 ~ 98	97 ~ 98	97 ~ 98	97 ~ 98	97 ~ 98	97 ~ 98
	Entry	92 ~ 93	92 ~ 93	92 ~ 93	92 ~ 93	92 ~ 93	92 ~ 93
Operating Power		5 ~ 10 W	10 ~ 20W	20 ~ 30W	30 ~ 40W	40 ~ 100W	100 ~ 200W

GLBTECH Products Lineup

Model	LED Light					
	Tube (CE)	Tube (KC)	Track	Down	Panel (300*600)	Smart Panel (Dimming)
						
Type	36 VDC	36 VCD	110/220 VAC	110/220 VAC	110/220 VAC	16 VAC
CRI typ. (Ra)	97 - 98	92 - 93	97 - 98	97 - 98	97 - 98	94 - 98
Operating Power	20W	20W	12 ~ 43W	12 ~ 43W	45W	40W



6" Down Light



7" Down Light



Square Down Light



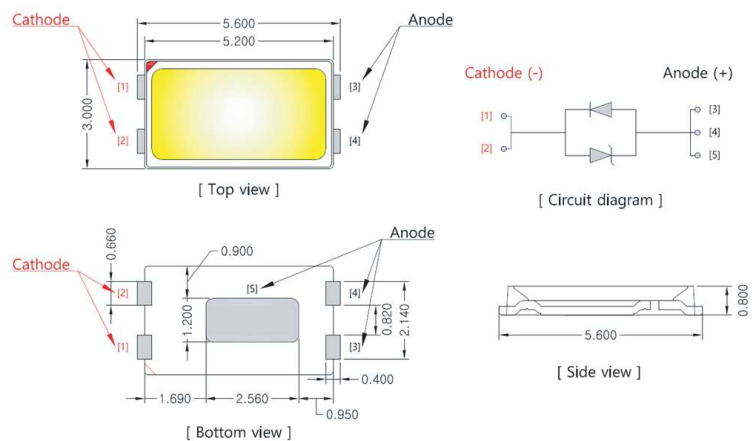
High CRI RaMax LED 0.2W GPM5630 Series

Features

- Almost Same Spectrum with Sunlight
- McAdam 3step Color Control
- Wide CCT Control (2500K~7000K)
- High CRI Patents : Certificated in Korea and pending in Worldwide 42 Countries

Applications

- Retrofit (Bulb, MR16, Par30)
- LED Tube or LED Panel Light
- Architectural or Decorative Lighting
- Broad casting or Studio Light



Dimension : 5.6x 3.0 x 1.0T mm
PKG Type : Flat

Electro-Optical Characteristics

CCT	Power	Current (DC)	Voltage (DC)	Grade	CRI-Ra (Typical)	CRI-R9 (Typical)	CRI-R12 (Typical)	Flux (lm)	Efficiency (lm/w)	Beam Angle
2700K	0.188W	65mA	2.9V	Ultra	97	98	95	20.7	110	120°
				Entry	92	62	74	24.4	130	120°
3200K	0.188W	65mA	2.9V	Ultra	97	98	95	22.3	118	120°
				Entry	92	62	74	25.9	138	120°
4000K	0.188W	65mA	2.9V	Ultra	98	97	96	22.9	122	120°
				Entry	92	61	75	27.5	146	120°
5600K	0.188W	65mA	2.9V	Ultra	98	96	96	24.4	130	120°
				Entry	93	60	76	29.0	154	120°
6500K	0.188W	65mA	2.9V	Ultra	98	96	96	24.3	129	120°
				Entry	93	60	76	28.9	153	120°



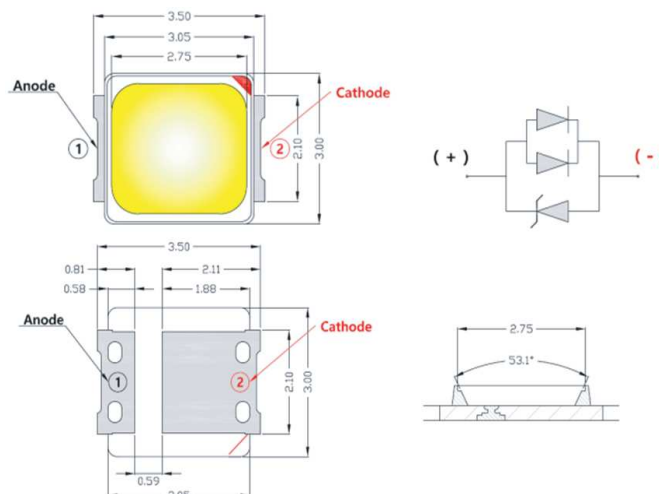
High CRI 98Ra *RaMax* LED 0.2W ~ 0.5W GPI3030 Series

Features

- Almost Same Spectrum with Sunlight
- McAdam 3step Color Control
- Wide CCT Control (2500K~7000K)
- High CRI Patents : Certificated in Korea and pending in Worldwide 42 Countries

Applications

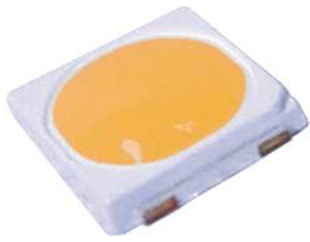
- Retrofit (Bulb, MR16, Par30)
- LED Tube or LED Panel Light
- Architectural or Decorative Lighting
- Broad casting or Studio Light



Dimension : 3.0 x 3.0 x 1.2T mm
PKG Type : Flat

Electro-Optical Characteristics

CCT	Power	Current (DC)	Voltage (DC)	Grade	CRI-Ra (Typical)	CRI-R9 (Typical)	CRI-R12 (Typical)	Flux (lm)	Efficiency (lm/w)	Beam Angle
2700K	0.188W	65mA	2.9V	Ultra	97	98	95	20.7	110	120°
				Entry	92	62	74	24.4	130	120°
4000K	0.188W	65mA	2.9V	Ultra	98	97	96	22.9	122	120°
				Entry	92	61	75	27.5	146	120°
6500K	0.188W	65mA	2.9V	Ultra	98	96	96	24.3	129	120°
				Entry	93	60	76	28.9	153	120°
3200K	0.45W	150mA	3.0V	Ultra	97	98	95	46.4	103	120°
				Entry	92	62	74	56.1	124	120°
5600K	0.45W	150mA	3.0V	Ultra	98	96	96	50.0	111	120°
				Entry	93	60	76	62.1	138	120°



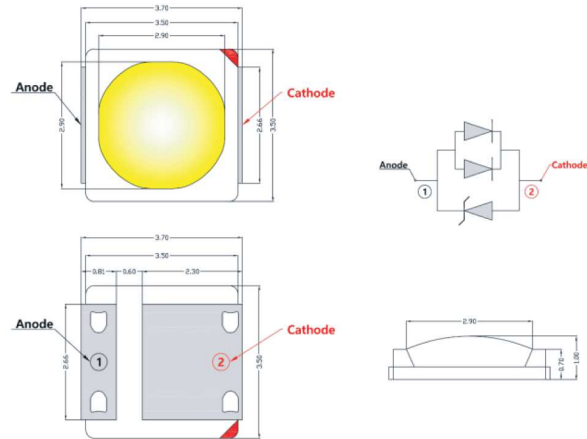
High CRI 98Ra *RaMax* LED 0.2~1.0W GPM3535 Series

Features

- Almost Same Spectrum with Sunlight
- McAdam 3step Color Control
- Wide CCT Control (2500K~7000K)
- High CRI Patents : Certificated in Korea and pending in Worldwide 42 Countries

Applications

- Retrofit (Bulb, MR16, Par30)
- LED Tube or LED Panel Light
- Architectural or Decorative Lighting
- Broad casting or Studio Light



Dimension : 3.5 x 3.5 x 1.2T mm
PKG Type : Convex (Low Dome)

Electro-Optical Characteristics

CCT	Power	Current (DC)	Voltage (DC)	Grade	CRI-Ra (Typical)	CRI-R9 (Typical)	CRI-R12 (Typical)	Flux (lm)	Efficiency (lm/w)	Beam Angle
2700K	0.45W	150mA	3.0V	Ultra	97	98	95	43.9	98	120°
				Entry	92	62	74	52.7	117	120°
4000K	0.45W	150mA	3.0V	Ultra	98	97	96	47.3	105	120°
				Entry	92	61	75	58.8	130	120°
6500K	0.45W	150mA	3.0V	Ultra	98	96	96	49.0	109	120°
				Entry	93	60	76	61.1	136	120°
3200K	1.10W	350mA	3.1V	Ultra	97	98	95	103.7	94	120°
				Entry	92	62	74	114.3	104	120°
5600K	1.10W	350mA	3.1V	Ultra	98	96	96	116.8	106	120°
				Entry	93	60	76	138.4	126	120°



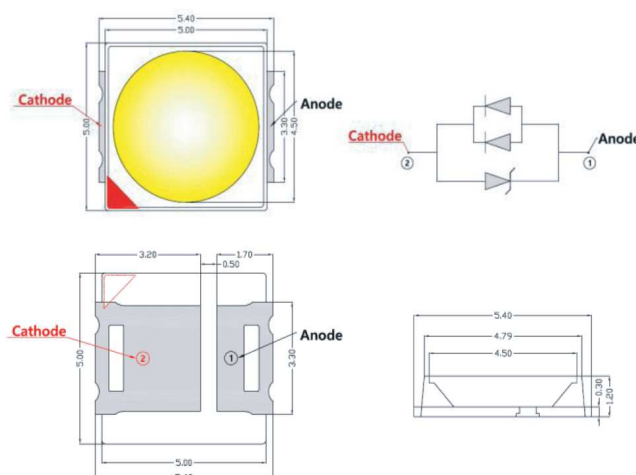
High CRI 98Ra *RaMax* LED 0.2~2.0W GPM5050 Series

Features

- Almost Same Spectrum with Sunlight
- McAdam 3step Color Control
- Wide CCT Control (2500K~7000K)
- High CRI Patents : Certificated in Korea and pending in Worldwide 42 Countries

Applications

- Retrofit (Bulb, MR16, Par30)
- LED Spot or LED Panel Light
- Architectural or Decorative Lighting
- Broad casting or Studio Light



Dimension : 5.0 x 5.0 x 1.0T mm
PKG Type : Flat

Electro-Optical Characteristics

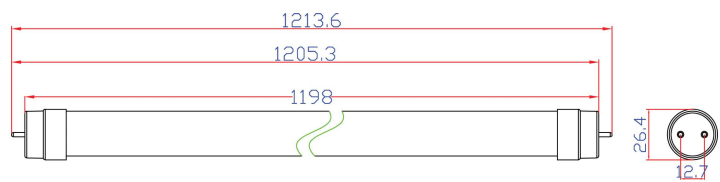
CCT	Power	Current (DC)	Voltage (DC)	Grade	CRI-Ra (Typical)	CRI-R9 (Typical)	CRI-R12 (Typical)	Flux (lm)	Efficiency (lm/w)	Beam Angle
3200K	0.45W	150mA	3.0V	Ultra	97	98	95	46.9	104	120°
				Entry	92	62	74	56.7	126	120°
5600K	0.45W	150mA	3.0V	Ultra	98	96	96	50.4	112	120°
				Entry	93	60	76	62.6	139	120°
4000K	1.1W	350mA	3.1V	Ultra	98	97	96	106.7	97	120°
				Entry	92	61	75	126.3	115	120°
2700K	1.65W	500mA	3.3V	Ultra	97	98	95	141.8	86	120°
				Entry	92	62	74	165.0	100	120°
6500K	1.65W	500mA	3.3V	Ultra	98	96	96	172.4	104	120°
				Entry	93	60	76	199.8	121	120°



High CRI 98Ra *RaMax* 20W T8-1200 GT8 Series (External Power Converter)

Features

- Almost Same Spectrum with Sunlight
- McAdam 3step Color Control
- Wide CCT Control (2500K~7000K)
- High CRI Patents : Certificated in Korea and pending in Worldwide 42 Countries



Dimension : 26.4(Ø) x 1198(L) mm
Input Power : DC 36~38V, 540~600mA
Certification : CE

Applications

- Retrofit 36W Fluorescent Lamp
- Clothes Store or Bakery Shop
- TV or Photo Studio
- Auto Car Color Painting
- Color Scanner (Printer, Copy Machine)



Electro-Optical Characteristics

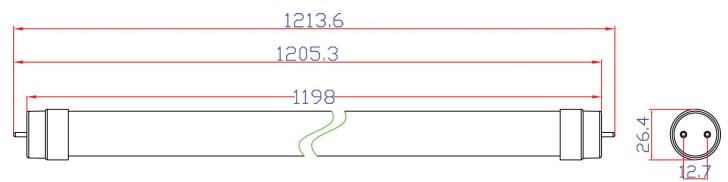
CCT	Power	Current (DC)	Voltage (DC)	Grade	CRI-Ra (Typical)	CRI-R9 (Typical)	CRI-R12 (Typical)	Flux (lm)	Efficiency (lm/w)	Beam Angle
2700K	20.5W	570mA	36V	Ultra	97	98	95	1,750	85	120°
3200K	20.5W	570mA	36V	Ultra	97	98	95	1,800	88	120°
4000K	20.5W	570mA	36V	Ultra	98	97	96	1,850	90	120°
5000K	20.5W	570mA	36V	Ultra	98	96	96	1,900	93	120°
5600K	20.5W	570mA	36V	Ultra	98	96	96	2,000	98	120°
6500K	20.5W	570mA	36V	Ultra	98	96	96	2,000	98	120°



High CRI 93Ra *RaMax* 20W T8-1200 GT8 Series (External Power Converter)

Features

- Almost Same Spectrum with Sunlight
- McAdam 3step Color Control
- Wide CCT Control (2500K-7000K)
- High CRI Patents : Certificated in Korea and pending in Worldwide 42 Countries



Dimension : 26.4(Ø) x 1198(L) mm
Input Power : DC 36-38V, 570mA
Certification : KC

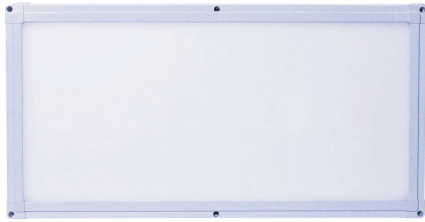
Applications

- Retrofit 36W Fluorescent Lamp
- Clothes Store or Bakery Shop
- TV or Photo Studio
- Auto Car Color Painting
- Color Scanner (Printer, Copy Machine)



Electro-Optical Characteristics

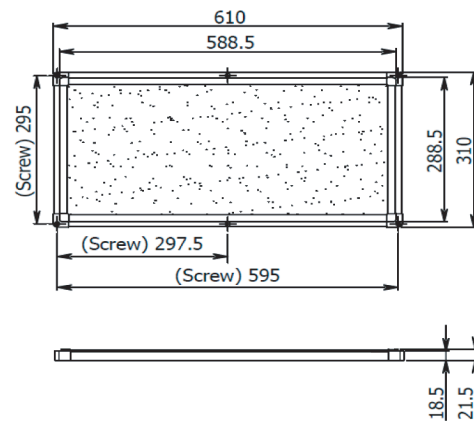
CCT	Power	Current (DC)	Voltage (DC)	Grade	CRI-Ra (Typical)	CRI-R9 (Typical)	CRI-R12 (Typical)	Flux (lm)	Efficiency (lm/w)	Beam Angle
2700K	20.5W	570mA	36V	Entry	92	62	74	2,200	107	120°
3200K	20.5W	570mA	36V	Entry	92	62	74	2,300	112	120°
4000K	20.5W	570mA	36V	Entry	92	61	75	2,400	117	120°
5000K	20.5W	570mA	36V	Entry	93	60	76	2,500	122	120°
5600K	20.5W	570mA	36V	Entry	93	60	76	2,550	124	120°
6500K	20.5W	570mA	36V	Entry	93	60	76	2,500	122	120°



High CRI 98Ra *RaMax* 45W GPL Series (Internal Power Converter)

Features

- Almost Same Spectrum with Sunlight
- McAdam 3step Color Control
- Wide CCT Control (2500K~7000K)
- High CRI Patents : Certificated in Korea and pending in Worldwide 42 Countries



Dimension : 610 x 310 x 21.5(T) mm
Power Factor (Power Converter) : 0.95

Applications

- Retrofit 36W Fluorescent Lamp
- Clothes Store or Bakery Shop
- Cosmetic or Jewelry Shop
- Museum, Gallery or Art Hall



Electro-Optical Characteristics

CCT	Power	Current (AC)	Voltage (AC)	Grade	CRI-Ra (Typical)	CRI-R9 (Typical)	CRI-R12 (Typical)	Flux (lm)	Efficiency (lm/w)	Beam Angle
2700K	43.9W	210mA 420mA	220V 110V	Ultra	97	98	95	3,000	68	120°
3200K	43.9W	210mA 420mA	220V 110V	Ultra	97	98	95	3,200	73	120°
4000K	43.9W	210mA 420mA	220V 110V	Ultra	98	97	96	3,300	75	120°
5000K	43.9W	210mA 420mA	220V 110V	Ultra	98	96	96	3,400	78	120°
5600K	43.9W	210mA 420mA	220V 110V	Ultra	98	96	96	3,500	80	120°
6500K	43.9W	210mA 420mA	220V 110V	Ultra	98	96	96	3,400	78	120°



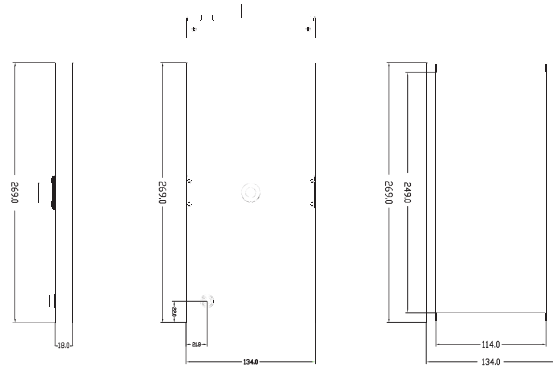
High CRI 98Ra **RaMax** Smart Panel 40W S950 / S450 Series (External Dimming & CCT Control)

Features

- Almost Same Spectrum with Sunlight
- McAdam 3step Color Control
- Wide CCT Control (2500K~7000K)
- High CRI Patents : Certificated in Korea and pending in Worldwide 42 Countries

Applications

- TV and Photo Studio Lighting
- Museum, Gallery or Art Hall



Dimension (S950) : 270 x 135 x 18(T) mm
Dimension (S450) : 265 x 125 x 12(T) mm



Electro-Optical Characteristics

LED Panel Light

Lighting Source	High CRI LED 2700K ~ 6500K
POWER	40W (Input AC 220V or DC 16V)
Luminous Flux	2700K : 2,700lm 6500K : 3,200lm
Control	CCT Control : 2700K ~ 6500K Brightness Dimming : 0~100%
Battery	DC 16V , 4.5A
Housing & Cooling	Aluminum & Air Convection Cooling
Component	Smart Panel 1ea , Dimming Controller 1ea Adapter 1ea , Cable 1ea,

Dimmer Controller

Power	DC 9 ~ 30V, max 500mA (Only Controller)
CCT Control	2700K ~ 6500K (Adjusted by 100K)
Brightness Control	0 ~ 100% (Adjusted by 10%)
Control Ch	1Ch (2Ch Option)
Housing	Steel (Black Powder Coating)
Dimension	120 * 110 * 35mm

Color Rendering Index

Ra_2700K	Ra_3000K	Ra_4000K	Ra_5000K	Ra_6000K	Ra_6500K
98	96	94	95	96	97
R9_2700K	R9_3000K	R9_4000K	R9_5000K	R9_6000K	R9_6500K
97	92	81	83	90	94

Production / Measurement / Reliability



◆ Production

We are manufacturing all of our LED PKG and COB in Korea.

Currently we achieved the manufacturing capacity of LED PKG over 35KKpcs/Month.

To satisfy our customers' quality needs, we comply with ISO9001 and ISO14001 regulations. Additionally, we are managing ERP system, Constant temperature and humidity system, Particle controlling system in clean-room for maintenance of optimized manufacturing system in order to correspond to customers' needs and in-time delivery.



◆ Measurement

We manage the quality standards complying to ISO3664, JIS-AAA, KC/KS, CE, UL/FCC and we apply integrating sphere-meters (Diameter 0.5m/2m), Goniophotometer, illuminometer (GL SPECTIS 1.0 touch / Minolta CL-500), Gold wire Full/Share Tester (Dage 4000) to maintain the faultless quality controlling system.



◆ Reliability

Before shipping out, we test our every LED, COB and its lighting product under the LM-80 test standard (LED PKG and COB's testing standard) of American DOE. We manage high reliability of our LED products applying Thermal chamber, High temperature and humidity chamber, Thermal shock testing chamber.



www.glbtech.co.kr

RaMax

Almost Same Spectrum with Sunlight!

GLBTECH

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