

VMU064024RD8TWA VMU064024RD9TWA

5" ROUND DC MODULE, 640mA MAX CURRENT, 6-CCT SELECTABLE

- 5" Round for commercial and residential applications
- 6-CCT on board selectable to reduce SKUs: 2700K-5000K
- Work with single channel output drivers
- CRI90 standard, CRI80 optional
- Suitable for open or fully enclosed luminaires
- For use in UL Class 2 lighting systems
- Meets UL8750 recognized
- RoHS compliant

General Specifications

	80CRI						90CRI					
	2700K	3000K	3500K	4000K	4500K	5000K	2700K	3000K	3500K	4000K	4500K	5000K
Input Current	280 mA (Nominal)						280 mA (Nominal)					
Nom. Input Voltage	33.4 VDC						33.4 VDC					
Nom. Input Power	9.4 W						9.4 W					
Nom. Lumen Output	1631 lm	1668 lm	1706 lm	1742 lm	1770 lm	1794 lm	1376 lm	1408 lm	1440 lm	1470 lm	1494 lm	1514 lm
Nom. Efficacy	174 lm/W	178 lm/W	182 lm/W	186 lm/W	189 lm/W	192 lm/W	147 lm/W	150 lm/W	154 lm/W	157 lm/W	160 lm/W	162 lm/W
Input Current	640 mA (Max.)						640 mA (Max.)					
Nom. Input Voltage	35.5 VDC						35.5 VDC					
Nom. Input Power	22.7 W						22.7 W					
Nom. Lumen Output	3567 lm	3649 lm	3731 lm	3809 lm	3872 lm	3923 lm	3010 lm	3080 lm	3149 lm	3215 lm	3268 lm	3311 lm
Nom. Efficacy	157 lm/W	161 lm/W	164 lm/W	168 lm/W	170 lm/W	173 lm/W	133 lm/W	136 lm/W	139 lm/W	142 lm/W	144 lm/W	146 lm/W

Beam Angle	120°
Color Rendering Index	CRI >=90 (Standard); CRI>=80 (Optional)
Storage Temperature Range	-40°C to 100°C / -40°F to 212°F
Operating Temperature Range (ta)	-40°C to 55°C / -40°F to 131°F
Maximum Case Temperature (Tc)	Safety: 105°C(221°F) L70(>60Khrs): 105°C(221°F) L90(45Khrs): 105°C(221°F)
Estimated Lumen Maintenance ^②	L70= >60,000 hours @ Tc max 105°C L90= 45,000 hours @ Tc max 105°C
Color Consistency	Binning per ANSI C78.377-2015 @ 25°C; Typ. 5 SDCM
Overall Size	4.92" Dia. x 0.22" H (Ø125mm x 5.6mm H)
PCB Material	MCPCB 1.0mm
LED Quantity	48pcs. 2700K + 48pcs. 5000K
Module Weight	TBD
Maximum Screw Installation Torque	25 inch - ounces
Wire gauge & Length	20AWG Red(+)/Blue(-) 12"/305mm
Packaging: Master Carton	TBD
Safety/Compliance	cURus (File # E351548) Suitable for UL Class 2 Lighting Systems RoHS Compliant Dry and Damp Location
Warranty	5 years @ Max. Tc from the date of manufacture

Tolerance for flux data is ±7%

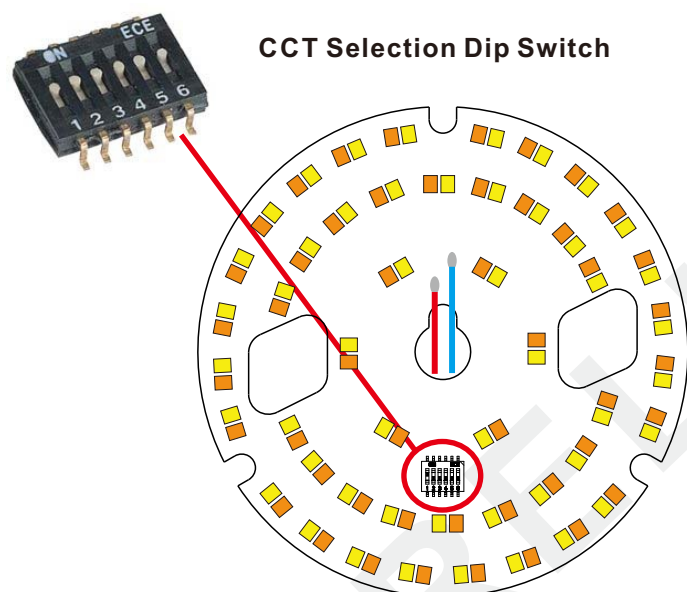
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CCT Selection Indication

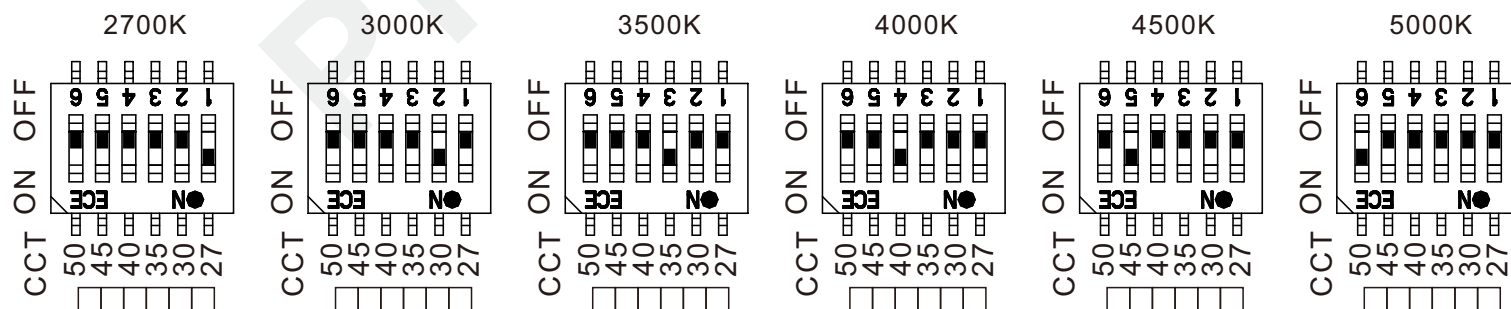
1. The VividHorse DC Module is a dual-channel LED product, that allows for CCT selection via the dip switch on the PCB. Available CCTs include 2700K, 3000K, 3500K, 4000K, 4500K and 5000K.
2. A pre-set CCT will come from the factory. Check the product label or packaging to see the pre-set CCT level.
3. Change the dip switch position to "ON" (1~6) to set the desired CCT level.

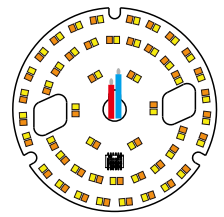
NOTE: ONLY keep one dip switch in the "ON" position, not doing so may result in an undesired CCT.



CCT Indication Table

	1	2	3	4	5	6
2700K	ON	OFF	OFF	OFF	OFF	OFF
3000K	OFF	ON	OFF	OFF	OFF	OFF
3500K	OFF	OFF	ON	OFF	OFF	OFF
4000K	OFF	OFF	OFF	ON	OFF	OFF
4500K	OFF	OFF	OFF	OFF	ON	OFF
5000K	OFF	OFF	OFF	OFF	OFF	ON





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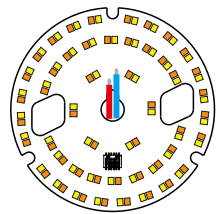
Electrical and Optical Specifications

2700K

LED Module Part Number	Number of LED	Input Current	Nom. Forward Voltage	Nom. Rated Power	Max. Fwd. Voltage	Max. Rated Power	Nom. Lum. Flux @2700K/80 CRI	Nom. Efficacy @2700K/80 CRI
VMU064024RD8TWA (5" Round)	48	80 mA	31.8 VDC	2.5 W	35 VDC	3 W	468 lm	184 lm/W
		120 mA	32.2 VDC	3.9 W	35 VDC	4 W	707 lm	183 lm/W
		160 mA	32.5 VDC	5.2 W	36 VDC	6 W	942 lm	181 lm/W
		200 mA	32.8 VDC	6.6 W	36 VDC	7 W	1174 lm	179 lm/W
		240 mA	33.1 VDC	8.0 W	36 VDC	9 W	1404 lm	177 lm/W
		280 mA	33.4 VDC	9.4 W	37 VDC	10 W	1631 lm	174 lm/W
		320 mA	33.7 VDC	10.8 W	37 VDC	12 W	1855 lm	172 lm/W
		360 mA	33.9 VDC	12.2 W	37 VDC	13 W	2077 lm	170 lm/W
		400 mA	34.2 VDC	13.7 W	38 VDC	15 W	2296 lm	168 lm/W
		440 mA	34.4 VDC	15.1 W	38 VDC	17 W	2513 lm	166 lm/W
		480 mA	34.6 VDC	16.6 W	38 VDC	18 W	2728 lm	164 lm/W
		520 mA	34.9 VDC	18.1 W	38 VDC	20 W	2941 lm	162 lm/W
		560 mA	35.1 VDC	19.6 W	39 VDC	22 W	3151 lm	160 lm/W
		600 mA	35.3 VDC	21.2 W	39 VDC	23 W	3360 lm	159 lm/W
		640 mA*	35.5 VDC	22.7 W	39 VDC	25 W	3567 lm	157 lm/W

3000K

LED Module Part Number	Number of LED	Input Current	Nom. Forward Voltage	Nom. Rated Power	Max. Fwd. Voltage	Max. Rated Power	Nom. Lum. Flux @3000K/80 CRI	Nom. Efficacy @3000K/80 CRI
VMU064024RD8TWA (5" Round)	48	80 mA	31.8 VDC	2.5 W	35 VDC	3 W	479 lm	188 lm/W
		120 mA	32.2 VDC	3.9 W	35 VDC	4 W	723 lm	187 lm/W
		160 mA	32.5 VDC	5.2 W	36 VDC	6 W	964 lm	185 lm/W
		200 mA	32.8 VDC	6.6 W	36 VDC	7 W	1201 lm	183 lm/W
		240 mA	33.1 VDC	8.0 W	36 VDC	9 W	1436 lm	181 lm/W
		280 mA	33.4 VDC	9.4 W	37 VDC	10 W	1668 lm	178 lm/W
		320 mA	33.7 VDC	10.8 W	37 VDC	12 W	1898 lm	176 lm/W
		360 mA	33.9 VDC	12.2 W	37 VDC	13 W	2125 lm	174 lm/W
		400 mA	34.2 VDC	13.7 W	38 VDC	15 W	2349 lm	172 lm/W
		440 mA	34.4 VDC	15.1 W	38 VDC	17 W	2571 lm	170 lm/W
		480 mA	34.6 VDC	16.6 W	38 VDC	18 W	2791 lm	168 lm/W
		520 mA	34.9 VDC	18.1 W	38 VDC	20 W	3008 lm	166 lm/W
		560 mA	35.1 VDC	19.6 W	39 VDC	22 W	3224 lm	164 lm/W
		600 mA	35.3 VDC	21.2 W	39 VDC	23 W	3437 lm	162 lm/W
		640 mA*	35.5 VDC	22.7 W	39 VDC	25 W	3649 lm	161 lm/W



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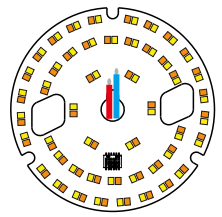
Electrical and Optical Specifications

3500K

LED Module Part Number	Number of LED	Input Current	Nom. Forward Voltage	Nom. Rated Power	Max. Fwd. Voltage	Max. Rated Power	Nom. Lum. Flux @3500K/80 CRI	Nom. Efficacy @3500K/80 CRI
VMU064024RD8TWA (5" Round)	48	80 mA	31.8 VDC	2.5 W	35 VDC	3 W	490 lm	193 lm/W
		120 mA	32.2 VDC	3.9 W	35 VDC	4 W	739 lm	192 lm/W
		160 mA	32.5 VDC	5.2 W	36 VDC	6 W	985 lm	189 lm/W
		200 mA	32.8 VDC	6.6 W	36 VDC	7 W	1228 lm	187 lm/W
		240 mA	33.1 VDC	8.0 W	36 VDC	9 W	1468 lm	185 lm/W
		280 mA	33.4 VDC	9.4 W	37 VDC	10 W	1706 lm	182 lm/W
		320 mA	33.7 VDC	10.8 W	37 VDC	12 W	1940 lm	180 lm/W
		360 mA	33.9 VDC	12.2 W	37 VDC	13 W	2172 lm	178 lm/W
		400 mA	34.2 VDC	13.7 W	38 VDC	15 W	2402 lm	176 lm/W
		440 mA	34.4 VDC	15.1 W	38 VDC	17 W	2629 lm	174 lm/W
		480 mA	34.6 VDC	16.6 W	38 VDC	18 W	2854 lm	172 lm/W
		520 mA	34.9 VDC	18.1 W	38 VDC	20 W	3076 lm	170 lm/W
		560 mA	35.1 VDC	19.6 W	39 VDC	22 W	3296 lm	168 lm/W
		600 mA	35.3 VDC	21.2 W	39 VDC	23 W	3515 lm	166 lm/W
		640 mA*	35.5 VDC	22.7 W	39 VDC	25 W	3731 lm	164 lm/W

4000K

LED Module Part Number	Number of LED	Input Current	Nom. Forward Voltage	Nom. Rated Power	Max. Fwd. Voltage	Max. Rated Power	Nom. Lum. Flux @4000K/80 CRI	Nom. Efficacy @4000K/80 CRI
VMU064024RD8TWA (5" Round)	48	80 mA	31.8 VDC	2.5 W	35 VDC	3 W	500 lm	197 lm/W
		120 mA	32.2 VDC	3.9 W	35 VDC	4 W	755 lm	196 lm/W
		160 mA	32.5 VDC	5.2 W	36 VDC	6 W	1006 lm	193 lm/W
		200 mA	32.8 VDC	6.6 W	36 VDC	7 W	1254 lm	191 lm/W
		240 mA	33.1 VDC	8.0 W	36 VDC	9 W	1499 lm	189 lm/W
		280 mA	33.4 VDC	9.4 W	37 VDC	10 W	1742 lm	186 lm/W
		320 mA	33.7 VDC	10.8 W	37 VDC	12 W	1981 lm	184 lm/W
		360 mA	33.9 VDC	12.2 W	37 VDC	13 W	2218 lm	182 lm/W
		400 mA	34.2 VDC	13.7 W	38 VDC	15 W	2452 lm	179 lm/W
		440 mA	34.4 VDC	15.1 W	38 VDC	17 W	2684 lm	177 lm/W
		480 mA	34.6 VDC	16.6 W	38 VDC	18 W	2914 lm	175 lm/W
		520 mA	34.9 VDC	18.1 W	38 VDC	20 W	3141 lm	173 lm/W
		560 mA	35.1 VDC	19.6 W	39 VDC	22 W	3366 lm	171 lm/W
		600 mA	35.3 VDC	21.2 W	39 VDC	23 W	3588 lm	170 lm/W
		640 mA*	35.5 VDC	22.7 W	39 VDC	25 W	3809 lm	168 lm/W



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Electrical and Optical Specifications

4500K

LED Module Part Number	Number of LED	Input Current	Nom. Forward Voltage	Nom. Rated Power	Max. Fwd. Voltage	Max. Rated Power	Nom. Lum. Flux @4500K/80 CRI	Nom. Efficacy @4500K/80 CRI
VMU064024RD8TWA (5" Round)	48	80 mA	31.8 VDC	2.5 W	35 VDC	3 W	508 lm	200 lm/W
		120 mA	32.2 VDC	3.9 W	35 VDC	4 W	767 lm	199 lm/W
		160 mA	32.5 VDC	5.2 W	36 VDC	6 W	1022 lm	197 lm/W
		200 mA	32.8 VDC	6.6 W	36 VDC	7 W	1275 lm	194 lm/W
		240 mA	33.1 VDC	8.0 W	36 VDC	9 W	1524 lm	192 lm/W
		280 mA	33.4 VDC	9.4 W	37 VDC	10 W	1770 lm	189 lm/W
		320 mA	33.7 VDC	10.8 W	37 VDC	12 W	2014 lm	187 lm/W
		360 mA	33.9 VDC	12.2 W	37 VDC	13 W	2255 lm	185 lm/W
		400 mA	34.2 VDC	13.7 W	38 VDC	15 W	2493 lm	182 lm/W
		440 mA	34.4 VDC	15.1 W	38 VDC	17 W	2728 lm	180 lm/W
		480 mA	34.6 VDC	16.6 W	38 VDC	18 W	2961 lm	178 lm/W
		520 mA	34.9 VDC	18.1 W	38 VDC	20 W	3192 lm	176 lm/W
		560 mA	35.1 VDC	19.6 W	39 VDC	22 W	3421 lm	174 lm/W
		600 mA	35.3 VDC	21.2 W	39 VDC	23 W	3647 lm	172 lm/W
		640 mA*	35.5 VDC	22.7 W	39 VDC	25 W	3872 lm	170 lm/W

5000K

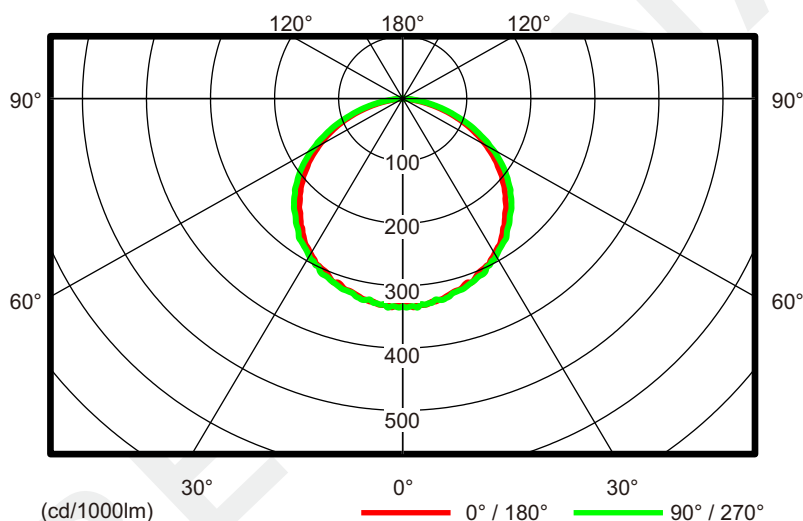
LED Module Part Number	Number of LED	Input Current	Nom. Forward Voltage	Nom. Rated Power	Max. Fwd. Voltage	Max. Rated Power	Nom. Lum. Flux @5000K/80 CRI	Nom. Efficacy @5000K/80 CRI
VMU064024RD8TWA (5" Round)	48	80 mA	31.8 VDC	2.5 W	35 VDC	3 W	515 lm	203 lm/W
		120 mA	32.2 VDC	3.9 W	35 VDC	4 W	777 lm	201 lm/W
		160 mA	32.5 VDC	5.2 W	36 VDC	6 W	1036 lm	199 lm/W
		200 mA	32.8 VDC	6.6 W	36 VDC	7 W	1292 lm	197 lm/W
		240 mA	33.1 VDC	8.0 W	36 VDC	9 W	1544 lm	194 lm/W
		280 mA	33.4 VDC	9.4 W	37 VDC	10 W	1794 lm	192 lm/W
		320 mA	33.7 VDC	10.8 W	37 VDC	12 W	2041 lm	189 lm/W
		360 mA	33.9 VDC	12.2 W	37 VDC	13 W	2285 lm	187 lm/W
		400 mA	34.2 VDC	13.7 W	38 VDC	15 W	2526 lm	185 lm/W
		440 mA	34.4 VDC	15.1 W	38 VDC	17 W	2765 lm	183 lm/W
		480 mA	34.6 VDC	16.6 W	38 VDC	18 W	3001 lm	181 lm/W
		520 mA	34.9 VDC	18.1 W	38 VDC	20 W	3235 lm	178 lm/W
		560 mA	35.1 VDC	19.6 W	39 VDC	22 W	3467 lm	177 lm/W
		600 mA	35.3 VDC	21.2 W	39 VDC	23 W	3696 lm	175 lm/W
		640 mA*	35.5 VDC	22.7 W	39 VDC	25 W	3923 lm	173 lm/W

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Light Distribution

Zone	Zone Flux	Zone Flux%	Sum Zone Flux	Sum Zone Flux%
0 ~ 10	101.8	3.2%	101.8	3.2%
10 ~ 20	292.8	9.1%	394.8	12.3%
20 ~ 30	449.4	14.0%	844.2	26.3%
30 ~ 40	550.8	17.1%	1394.8	43.4%
40 ~ 50	581.8	18.1%	1976.8	61.5%
50 ~ 60	535.0	16.6%	2511.6	78.1%
60 ~ 70	410.4	12.8%	2922.2	90.9%
70 ~ 80	227.4	7.1%	3149.6	98.0%
80 ~ 90	52.0	1.6%	3201.4	99.6%
90 ~ 180	12.6	0.4%	3214.0	100.0%

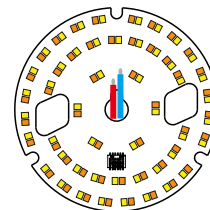


Luminous Flux De-Rating: CRI Multipliers

CRI 80(R9> 0)	1.000
CRI 90(R9>50)	0.844

NOTES:

- Performance data (pg. 3~5) is based on Tc mod = 25°C. See thermal de-rating chart (pg. 7) for higher temperature operation.
- Zone Flux and light distribution data (pg. 6) is based on nominal input current 320mA, 4000K sample, thermal stable.
- Tolerance for flux data is ±7%
- Specifications are subject to change without notice.
- The LED DC Module can be configure with different LED chip quantities, series and parallel design configurations to meet a specific design requirement. Contact Fulham for further assistance.
- Modules need to be operated at a current less than the max. current, below the Tc rating.



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Thermal Specifications

DC Module

Storage Temperature Range	-40 to 100°C / -40 to 212°F
Operating Ambient Temperature Range (ta)	-40 to 55°C / -40 to 140°F
Maximum Case Temperature (Tc)	Safety: 105°C(221°F) / L70(>60Khrs): 105°C(221°F) / L90(45Khrs): 105°C(221°F)

Thermal De-Rating

Module Tc vs. Luminous Flux vs. Forward Voltage

Module Case Temperature (Tc)	Total Vf Multiplier	Luminous Flux Multiplier
25°C	1.000	1.000
30°C	0.998	0.991
35°C	0.997	0.983
40°C	0.995	0.974
45°C	0.993	0.966
50°C	0.991	0.957
55°C	0.990	0.949
60°C	0.988	0.940
65°C	0.986	0.932
70°C	0.985	0.923
75°C	0.983	0.915
80°C	0.981	0.906
85°C	0.980	0.898
90°C	0.978	0.890
95°C	0.976	0.881
100°C	0.974	0.873
105°C	0.973	0.864

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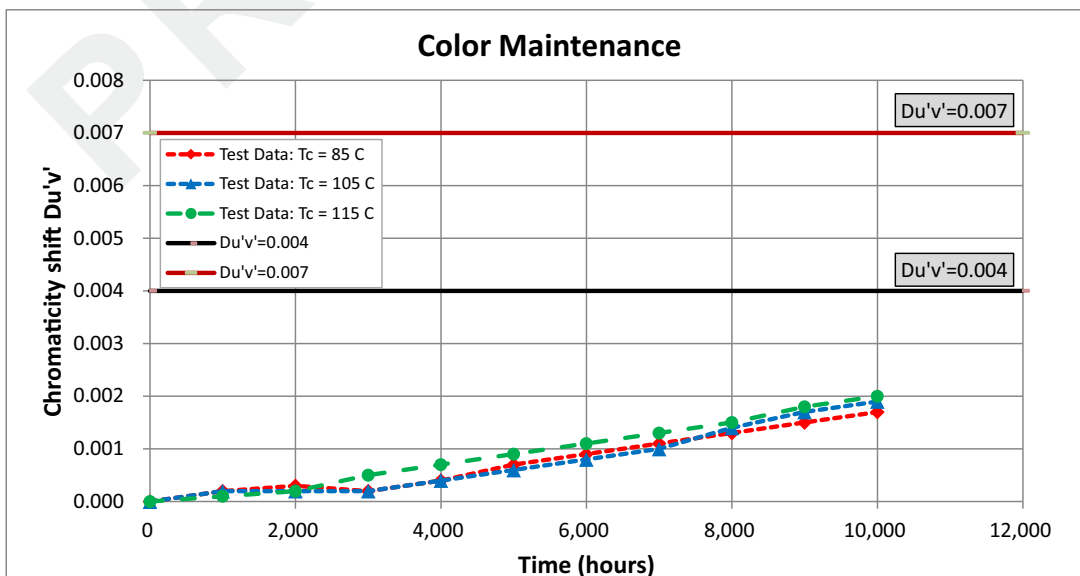
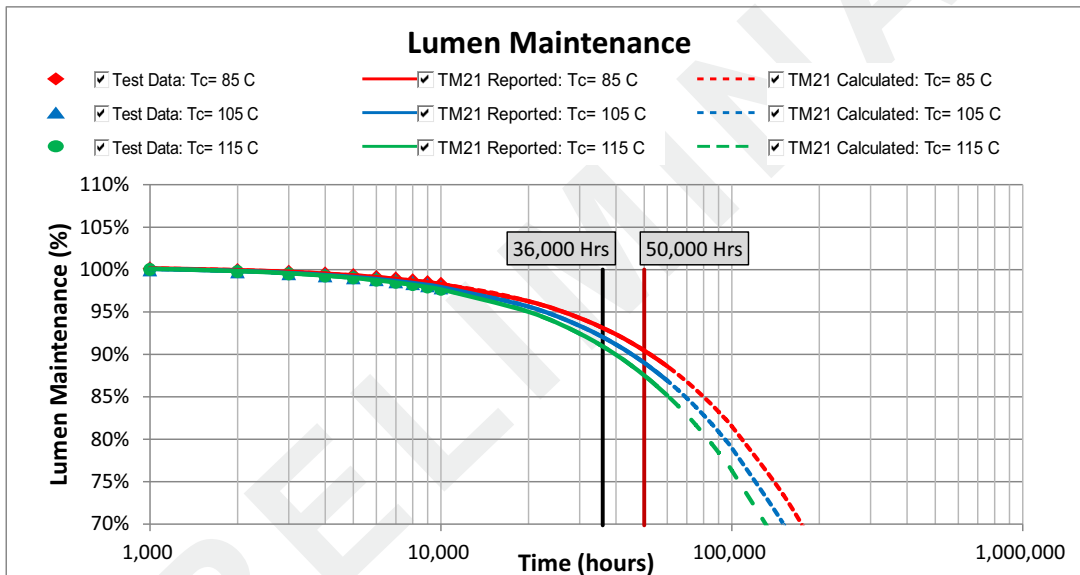
Certification Chart

Model	Classification
VMU064024RDxTWA	
RoHS COMPLIANT	YES
CULUS	YES
Suitable for UL Class 2 Lighting System	YES

Energy Star™ TM-21 Calculator Data

Tc Module	Reported L70	Reported L90
85°C	>60,000 Hrs	52,000 Hrs
105°C	>60,000 Hrs	45,000 Hrs
115°C	>60,000 Hrs	40,000 Hrs
Tc Module	Calculated L70	Calculated L90
85°C	247,000 Hrs	52,000 Hrs
105°C	214,000 Hrs	45,000 Hrs
115°C	187,000 Hrs	40,000 Hrs

LED Lumen & Color Maintenance Data per LM-80 report and TM-21 Calculator



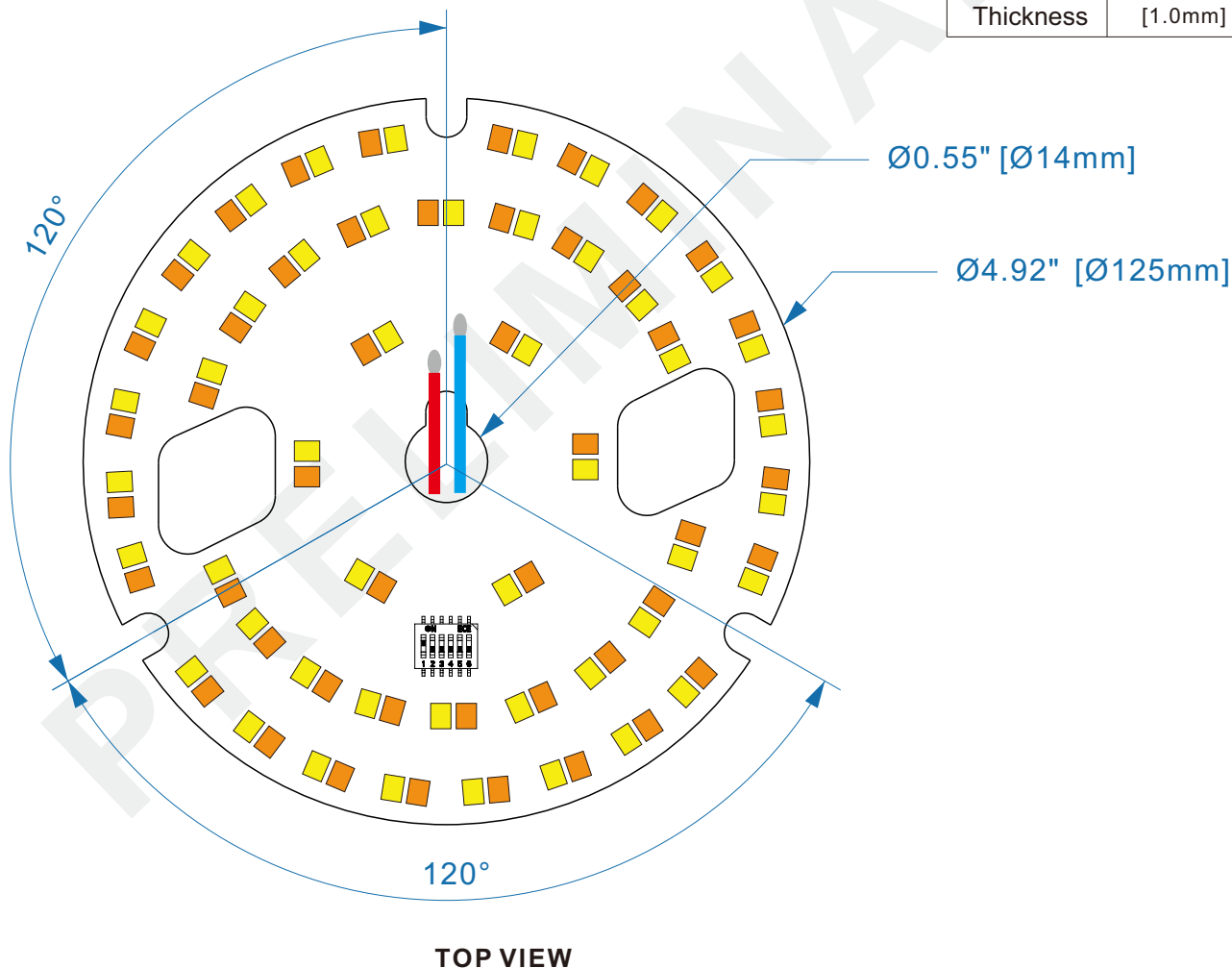
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Mechanical Drawings

4.92" Dia. x 0.22"H

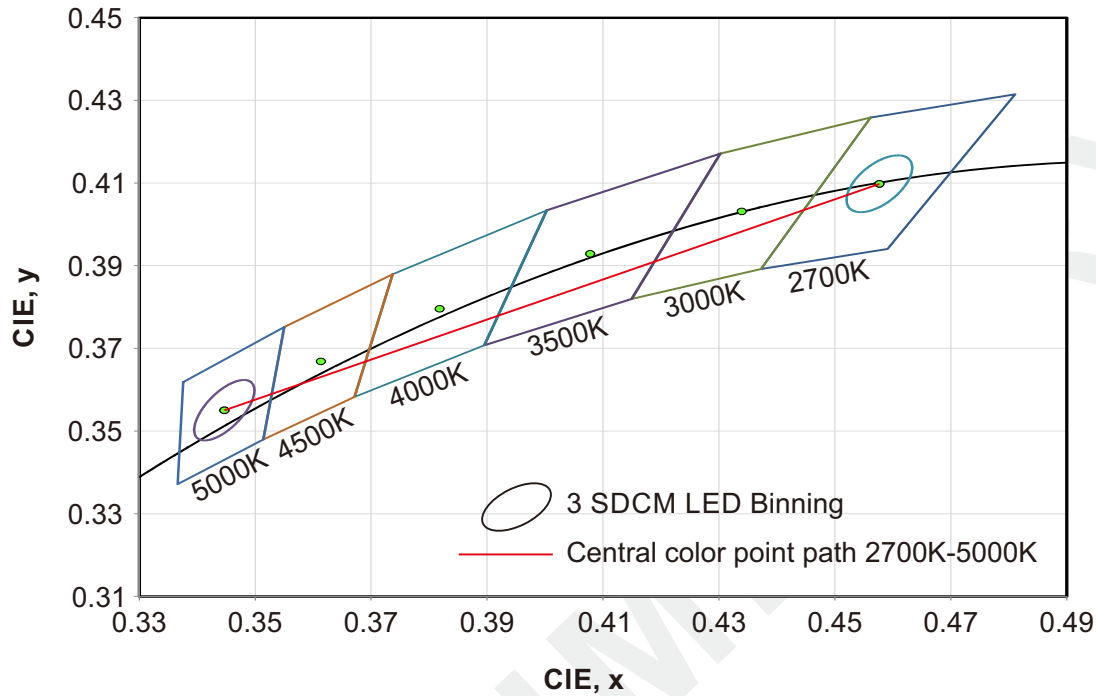
[Ø125mm x 5.6mm]

Overall Dimensions	
Diameter	4.92" [125mm]
Height	0.22" [5.6mm]
Wire Length	12" [305mm]
PCB Thickness	0.039" [1.0mm]

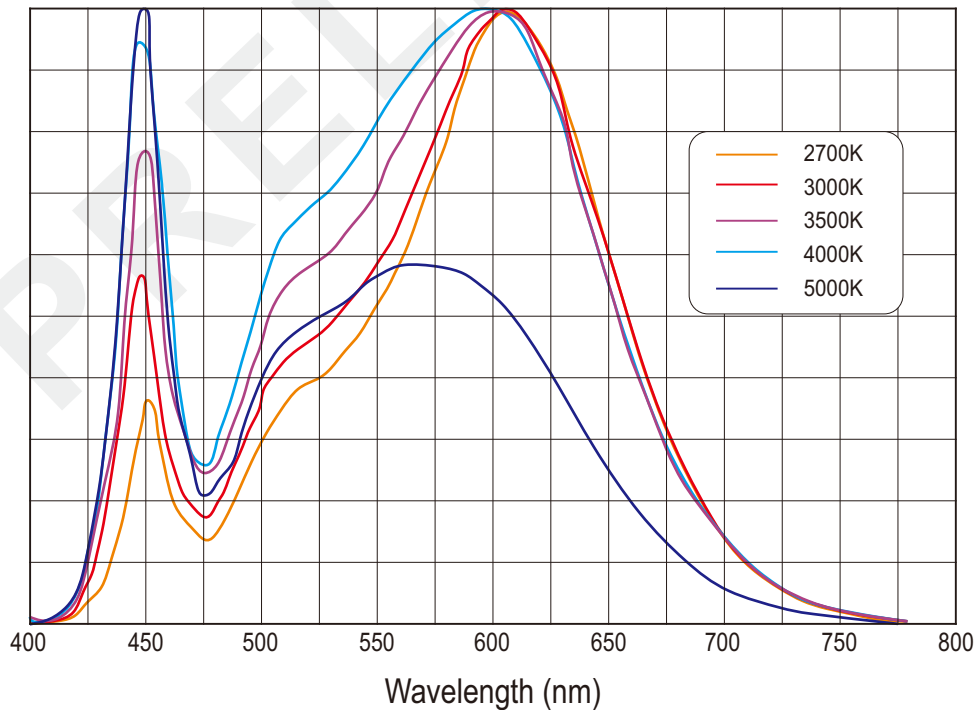


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Color and Binning

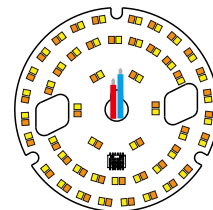


Optical Spectrum



NOTES:

- 1) The Color and Binning and Optical Spectrum charts are for reference only. For more detailed info, contact factory.
- 2) Reference Samsung Chromaticity Diagram for Color and Binning. Binning per ANSI C78.377-2015 @ 25°C; 3 SDCM.
- 3) The Optical Spectrum values vary depending on product type and color rank.



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Guidelines

Fastening Notes

- If fastening by screw hole a recommended screw size: 6-20 x 5/8" flat head drilling screws. Use all available screw holes to ensure good contact between back side of module and mounting surface. Refer to max specified torque for installation.
- BJB P2F (Push-to-Fix) fixing elements for PCBs can be used to fasten LED modules to mounting surface. Reference BJB's website for ordering information and specific model to use:
<http://www.bjb.com/index.php?pid=376706&lid=10>.

Environmental Rating

- The DC Modules have been evaluated for use in dry or damp locations only. If used in wet locations, acceptability and the need for additional evaluation shall be determined in the end product.

Electrostatic Sensitive Product (ESD)

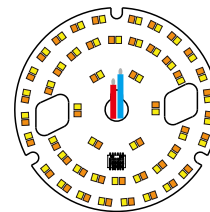
- Fulham LED products should be handled with proper measures to protect against any potential ESD damage.
- When servicing, personnel should be ground and direct contact with LED should be avoided.

Thermal Management

- Proper thermal management should be employed to ensure life and reliability of product. Max Tc of module should not be exceeded.
- Use of thermal grease, paste, pad, or other material interface is highly recommended.

Polarity Notes

- DC Modules are polarity sensitive.
- Ensure that "positive" from LED Driver is connected to "positive" of LED modules and that "negative" from LED Driver is connected to "negative" of LED modules.
- Polarities of modules are marked with "+" for positive and "-" for negative.



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Part Number Matrix

V M U 064 024 RD 9 TWA

<u>Product Line</u> V = VividHorse	<u>Type</u> M = Module (UL Class 2)	<u>Control Type</u> U = None	<u>Input Current</u> 064 = 640mA Max.	<u>Typ. Power</u> 024 = 24W	<u>Design</u> RD = Round	<u>CRI</u> 8 = 80 9 = 90	<u>Color Temperature</u> TW = 2700K-5000K Tunable White	<u>Option</u> A = Standard
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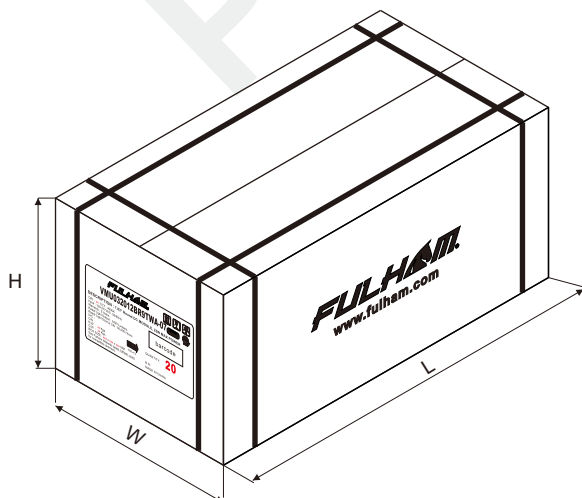
© CRI90 option is standard; CRI80 option is made to order with MOQ and lead time.

Product Image:

TOP VIEW

Packaging

Master Carton



OUTER DIMENSION		
L	W	H
12.60"(320mm)	9.84"(250mm)	9.76"(248mm)
Net Weight	Gross Weight	QUANTITY
7.2 lbs. (3.3 kg)	8.16 lbs. (3.7 kg)	120pcs.