

VMU032012RD8TWA VMU032012RD9TWA

3" ROUND DC MODULE, 320mA MAX CURRENT, 6-CCT SELECTABLE

- 3" 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	140 mA (Nominal)						140 mA (Nominal)					
Nom. Input Voltage	33.4 VDC						33.4 VDC					
Nom. Input Power	4.7 W						4.7 W					
Nom. Lumen Output	815 lm	834 lm	853 lm	871 lm	885 lm	897 lm	688 lm	704 lm	720 lm	735 lm	747 lm	757 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	320 mA (Max.)						320 mA (Max.)					
Nom. Input Voltage	35.5 VDC						35.5 VDC					
Nom. Input Power	11.4 W						11.4 W					
Nom. Lumen Output	1783 lm	1824 lm	1865 lm	1905 lm	1936 lm	1962 lm	1505 lm	1540 lm	1574 lm	1607 lm	1634 lm	1656 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	2.95" Dia. x 0.22" H (Ø75mm x 5.6mm H)
PCB Material	MCPCB 1.0mm
LED Quantity	24pcs. 2700K + 24pcs. 5000K
Module Weight	0.06lbs. (27g)
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%

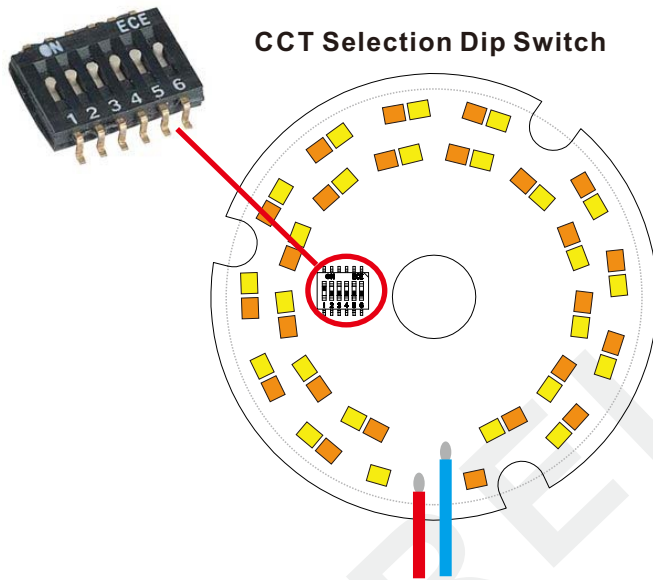
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CCT Selection Indication

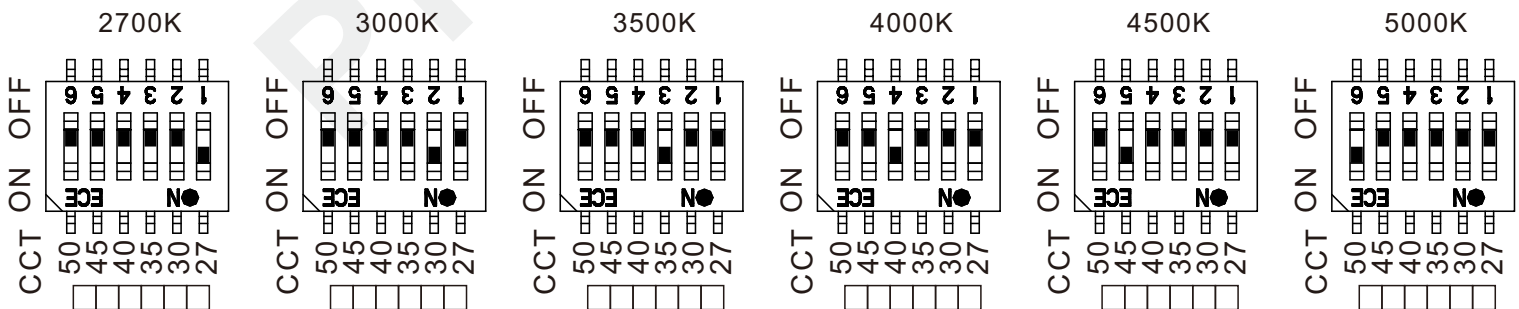
1. The VividHorse DC Module is a dual-channel LED product, that allows for CCT selection via the dip switch on the PCB. Available CCTs include 2700K, 3000K, 3500K, 4000K, 4500K and 5000K.
2. A pre-set CCT will come from the factory. Check the product label or packaging to see the pre-set CCT level.
3. 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
VMU032012RD8TWA (3" Round)	24	40 mA	31.8 VDC	1.3 W	35 VDC	1 W	234 lm	184 lm/W
		60 mA	32.2 VDC	1.9 W	35 VDC	2 W	353 lm	183 lm/W
		80 mA	32.5 VDC	2.6 W	36 VDC	3 W	471 lm	181 lm/W
		100 mA	32.8 VDC	3.3 W	36 VDC	4 W	587 lm	179 lm/W
		120 mA	33.1 VDC	4.0 W	36 VDC	4 W	702 lm	177 lm/W
		140 mA	33.4 VDC	4.7 W	37 VDC	5 W	815 lm	174 lm/W
		160 mA	33.7 VDC	5.4 W	37 VDC	6 W	928 lm	172 lm/W
		180 mA	33.9 VDC	6.1 W	37 VDC	7 W	1038 lm	170 lm/W
		200 mA	34.2 VDC	6.8 W	38 VDC	8 W	1148 lm	168 lm/W
		220 mA	34.4 VDC	7.6 W	38 VDC	8 W	1257 lm	166 lm/W
		240 mA	34.6 VDC	8.3 W	38 VDC	9 W	1364 lm	164 lm/W
		260 mA	34.9 VDC	9.1 W	38 VDC	10 W	1470 lm	162 lm/W
		280 mA	35.1 VDC	9.8 W	39 VDC	11 W	1576 lm	160 lm/W
		300 mA	35.3 VDC	10.6 W	39 VDC	12 W	1680 lm	159 lm/W
		320 mA*	35.5 VDC	11.4 W	39 VDC	12 W	1783 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
VMU032012RD8TWA (3" Round)	24	40 mA	31.8 VDC	1.3 W	35 VDC	1 W	240 lm	188 lm/W
		60 mA	32.2 VDC	1.9 W	35 VDC	2 W	361 lm	187 lm/W
		80 mA	32.5 VDC	2.6 W	36 VDC	3 W	482 lm	185 lm/W
		100 mA	32.8 VDC	3.3 W	36 VDC	4 W	601 lm	183 lm/W
		120 mA	33.1 VDC	4.0 W	36 VDC	4 W	718 lm	181 lm/W
		140 mA	33.4 VDC	4.7 W	37 VDC	5 W	834 lm	178 lm/W
		160 mA	33.7 VDC	5.4 W	37 VDC	6 W	949 lm	176 lm/W
		180 mA	33.9 VDC	6.1 W	37 VDC	7 W	1062 lm	174 lm/W
		200 mA	34.2 VDC	6.8 W	38 VDC	8 W	1175 lm	172 lm/W
		220 mA	34.4 VDC	7.6 W	38 VDC	8 W	1286 lm	170 lm/W
		240 mA	34.6 VDC	8.3 W	38 VDC	9 W	1395 lm	168 lm/W
		260 mA	34.9 VDC	9.1 W	38 VDC	10 W	1504 lm	166 lm/W
		280 mA	35.1 VDC	9.8 W	39 VDC	11 W	1612 lm	164 lm/W
		300 mA	35.3 VDC	10.6 W	39 VDC	12 W	1719 lm	162 lm/W
		320 mA*	35.5 VDC	11.4 W	39 VDC	12 W	1824 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
VMU032012RD8TWA (3" Round)	24	40 mA	31.8 VDC	1.3 W	35 VDC	1 W	245 lm	193 lm/W
		60 mA	32.2 VDC	1.9 W	35 VDC	2 W	370 lm	192 lm/W
		80 mA	32.5 VDC	2.6 W	36 VDC	3 W	493 lm	189 lm/W
		100 mA	32.8 VDC	3.3 W	36 VDC	4 W	614 lm	187 lm/W
		120 mA	33.1 VDC	4.0 W	36 VDC	4 W	734 lm	185 lm/W
		140 mA	33.4 VDC	4.7 W	37 VDC	5 W	853 lm	182 lm/W
		160 mA	33.7 VDC	5.4 W	37 VDC	6 W	970 lm	180 lm/W
		180 mA	33.9 VDC	6.1 W	37 VDC	7 W	1086 lm	178 lm/W
		200 mA	34.2 VDC	6.8 W	38 VDC	8 W	1201 lm	176 lm/W
		220 mA	34.4 VDC	7.6 W	38 VDC	8 W	1314 lm	174 lm/W
		240 mA	34.6 VDC	8.3 W	38 VDC	9 W	1427 lm	172 lm/W
		260 mA	34.9 VDC	9.1 W	38 VDC	10 W	1538 lm	170 lm/W
		280 mA	35.1 VDC	9.8 W	39 VDC	11 W	1648 lm	168 lm/W
		300 mA	35.3 VDC	10.6 W	39 VDC	12 W	1757 lm	166 lm/W
		320 mA*	35.5 VDC	11.4 W	39 VDC	12 W	1865 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
VMU032012RD8TWA (3" Round)	24	40 mA	31.8 VDC	1.3 W	35 VDC	1 W	250 lm	197 lm/W
		60 mA	32.2 VDC	1.9 W	35 VDC	2 W	377 lm	196 lm/W
		80 mA	32.5 VDC	2.6 W	36 VDC	3 W	503 lm	193 lm/W
		100 mA	32.8 VDC	3.3 W	36 VDC	4 W	627 lm	191 lm/W
		120 mA	33.1 VDC	4.0 W	36 VDC	4 W	750 lm	189 lm/W
		140 mA	33.4 VDC	4.7 W	37 VDC	5 W	871 lm	186 lm/W
		160 mA	33.7 VDC	5.4 W	37 VDC	6 W	991 lm	184 lm/W
		180 mA	33.9 VDC	6.1 W	37 VDC	7 W	1109 lm	182 lm/W
		200 mA	34.2 VDC	6.8 W	38 VDC	8 W	1226 lm	179 lm/W
		220 mA	34.4 VDC	7.6 W	38 VDC	8 W	1342 lm	177 lm/W
		240 mA	34.6 VDC	8.3 W	38 VDC	9 W	1457 lm	175 lm/W
		260 mA	34.9 VDC	9.1 W	38 VDC	10 W	1570 lm	173 lm/W
		280 mA	35.1 VDC	9.8 W	39 VDC	11 W	1683 lm	171 lm/W
		300 mA	35.3 VDC	10.6 W	39 VDC	12 W	1794 lm	170 lm/W
		320 mA*	35.5 VDC	11.4 W	39 VDC	12 W	1905 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
VMU032012RD8TWA (3" Round)	24	40 mA	31.8 VDC	1.3 W	35 VDC	1 W	254 lm	200 lm/W
		60 mA	32.2 VDC	1.9 W	35 VDC	2 W	384 lm	199 lm/W
		80 mA	32.5 VDC	2.6 W	36 VDC	3 W	511 lm	197 lm/W
		100 mA	32.8 VDC	3.3 W	36 VDC	4 W	637 lm	194 lm/W
		120 mA	33.1 VDC	4.0 W	36 VDC	4 W	762 lm	192 lm/W
		140 mA	33.4 VDC	4.7 W	37 VDC	5 W	885 lm	189 lm/W
		160 mA	33.7 VDC	5.4 W	37 VDC	6 W	1007 lm	187 lm/W
		180 mA	33.9 VDC	6.1 W	37 VDC	7 W	1127 lm	185 lm/W
		200 mA	34.2 VDC	6.8 W	38 VDC	8 W	1246 lm	182 lm/W
		220 mA	34.4 VDC	7.6 W	38 VDC	8 W	1364 lm	180 lm/W
		240 mA	34.6 VDC	8.3 W	38 VDC	9 W	1481 lm	178 lm/W
		260 mA	34.9 VDC	9.1 W	38 VDC	10 W	1596 lm	176 lm/W
		280 mA	35.1 VDC	9.8 W	39 VDC	11 W	1710 lm	174 lm/W
		300 mA	35.3 VDC	10.6 W	39 VDC	12 W	1824 lm	172 lm/W
		320 mA*	35.5 VDC	11.4 W	39 VDC	12 W	1936 lm	170 lm/W

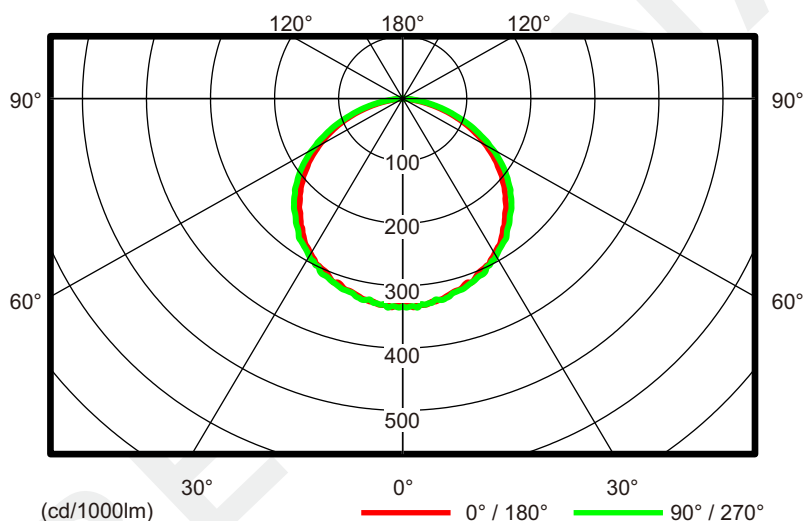
5000K

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
VMU032012RD8TWA (3" Round)	24	40 mA	31.8 VDC	1.3 W	35 VDC	1 W	258 lm	203 lm/W
		60 mA	32.2 VDC	1.9 W	35 VDC	2 W	389 lm	201 lm/W
		80 mA	32.5 VDC	2.6 W	36 VDC	3 W	518 lm	199 lm/W
		100 mA	32.8 VDC	3.3 W	36 VDC	4 W	646 lm	197 lm/W
		120 mA	33.1 VDC	4.0 W	36 VDC	4 W	772 lm	194 lm/W
		140 mA	33.4 VDC	4.7 W	37 VDC	5 W	897 lm	192 lm/W
		160 mA	33.7 VDC	5.4 W	37 VDC	6 W	1020 lm	189 lm/W
		180 mA	33.9 VDC	6.1 W	37 VDC	7 W	1142 lm	187 lm/W
		200 mA	34.2 VDC	6.8 W	38 VDC	8 W	1263 lm	185 lm/W
		220 mA	34.4 VDC	7.6 W	38 VDC	8 W	1382 lm	183 lm/W
		240 mA	34.6 VDC	8.3 W	38 VDC	9 W	1500 lm	181 lm/W
		260 mA	34.9 VDC	9.1 W	38 VDC	10 W	1617 lm	178 lm/W
		280 mA	35.1 VDC	9.8 W	39 VDC	11 W	1733 lm	177 lm/W
		300 mA	35.3 VDC	10.6 W	39 VDC	12 W	1848 lm	175 lm/W
		320 mA*	35.5 VDC	11.4 W	39 VDC	12 W	1962 lm	173 lm/W

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Light Distribution

Zone	Zone Flux	Zone Flux%	Sum Zone Flux	Sum Zone Flux%
0 ~ 10	50.9	3.2%	50.9	3.2%
10 ~ 20	146.4	9.1%	197.4	12.3%
20 ~ 30	224.7	14.0%	422.1	26.3%
30 ~ 40	275.4	17.1%	697.4	43.4%
40 ~ 50	290.9	18.1%	988.4	61.5%
50 ~ 60	267.5	16.6%	1255.8	78.1%
60 ~ 70	205.2	12.8%	1461.1	90.9%
70 ~ 80	113.7	7.1%	1574.8	98.0%
80 ~ 90	26.0	1.6%	1600.7	99.6%
90 ~ 180	6.3	0.4%	1607.0	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 $\pm 7\%$
- Specifications are subject to change without notice.
- The LED DC Module can be configured 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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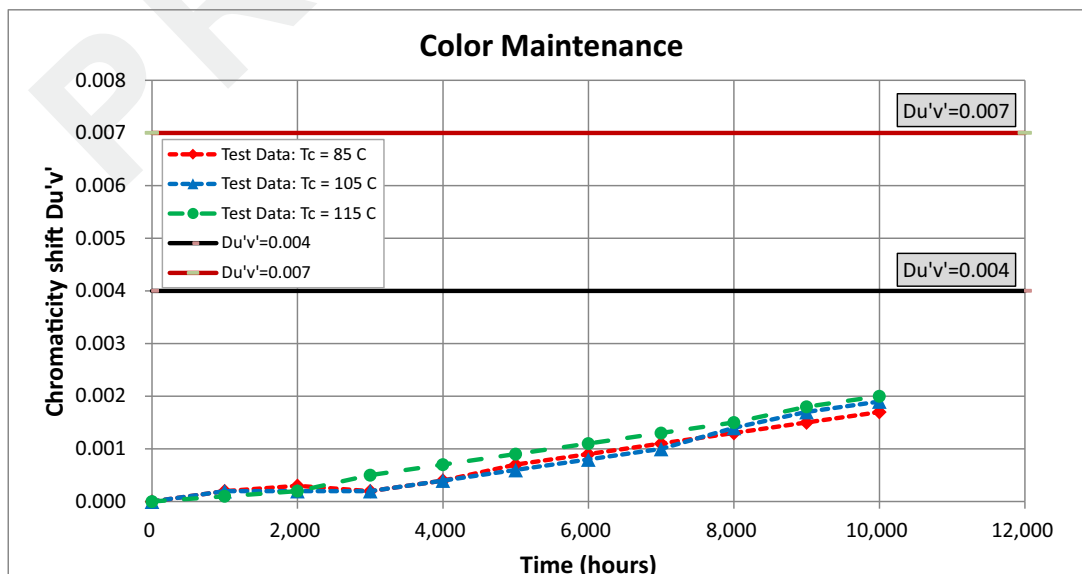
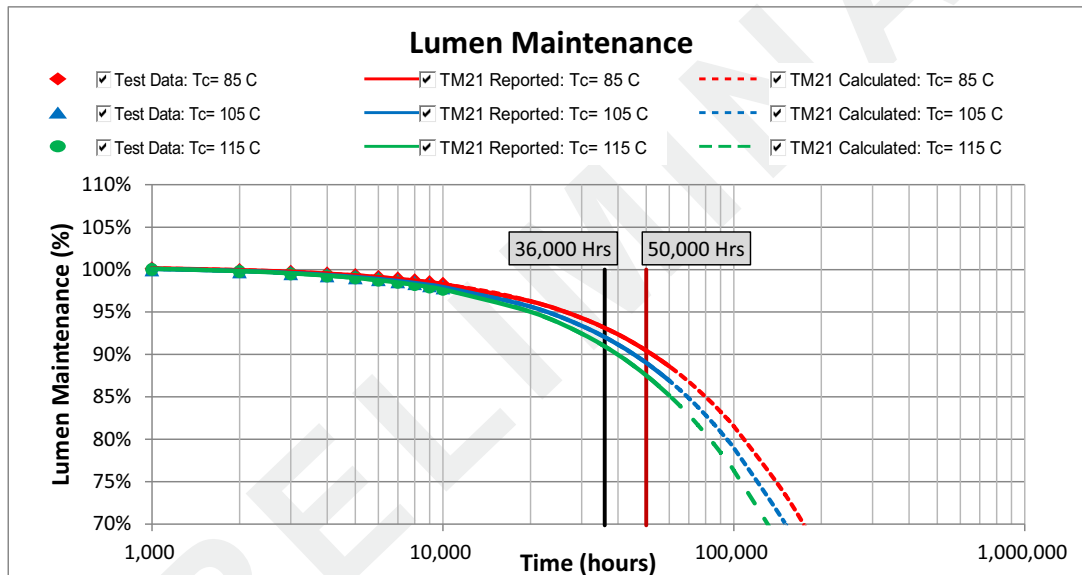
Certification Chart

Model	VMU032012RDxTWA
Classification	
	YES
	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



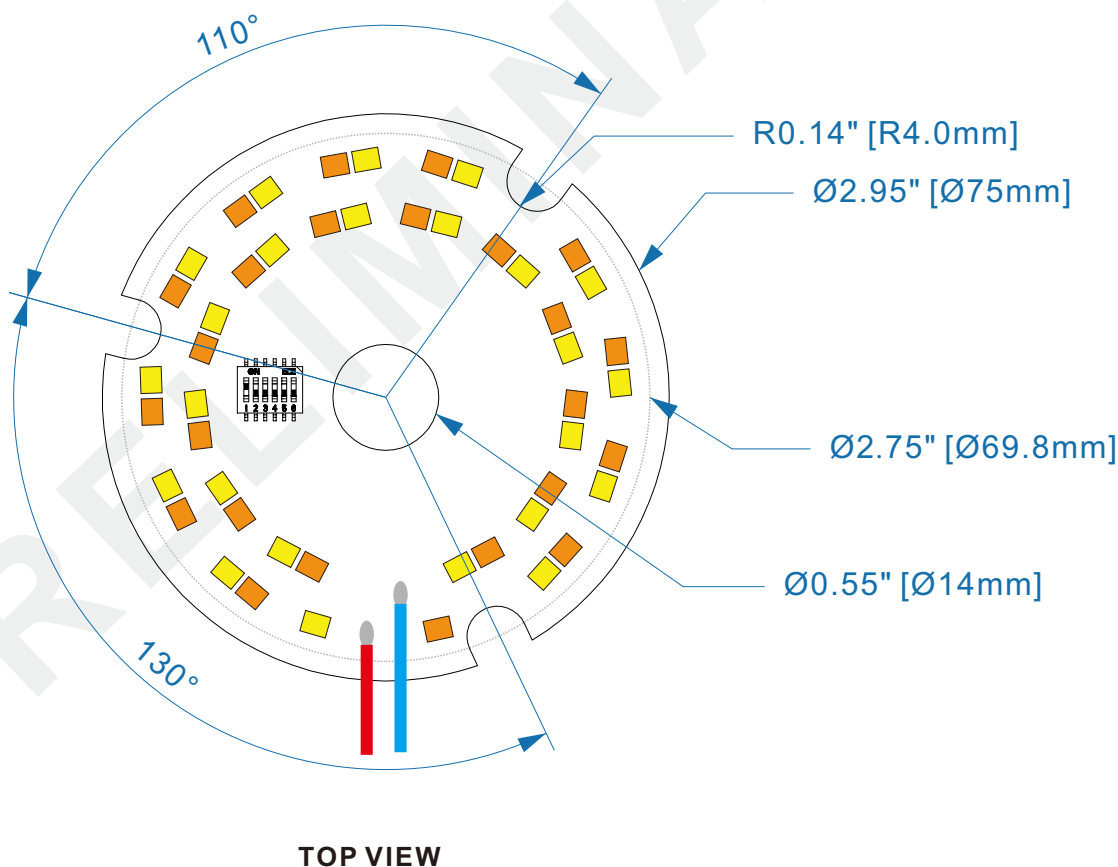
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Mechanical Drawings

2.95" Dia. x 0.22"H

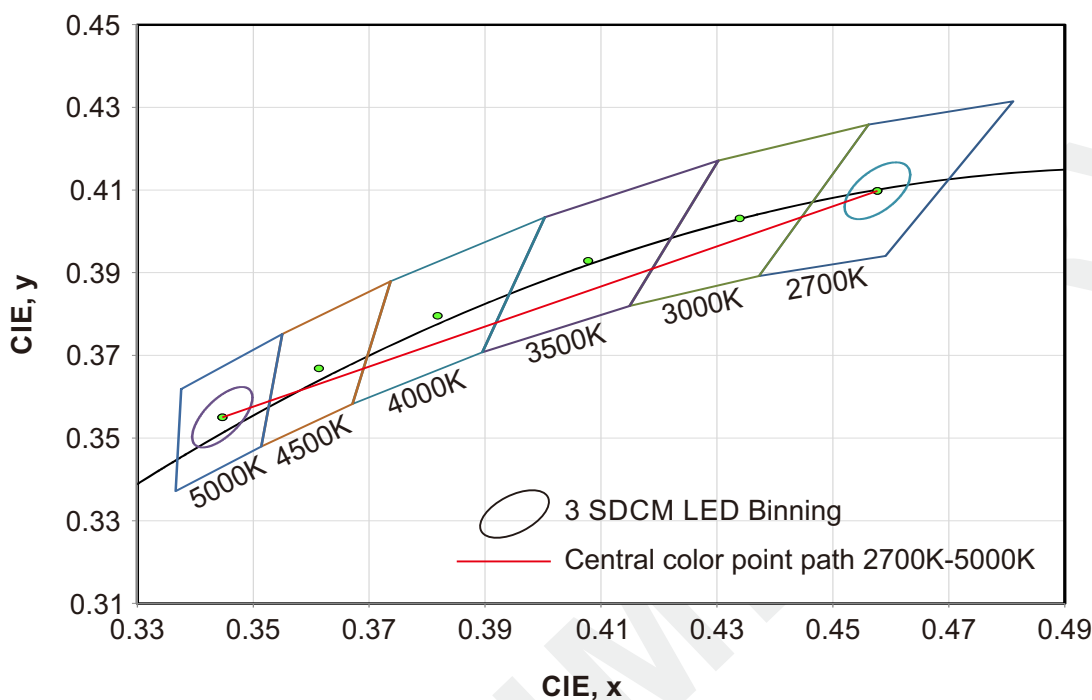
[Ø75mm x 5.6mm]

Overall Dimensions	
Diameter	2.95" [75mm]
Height	0.22" [5.6mm]
Wire Length	12" [305mm]
PCB Thickness	0.039" [1.0mm]

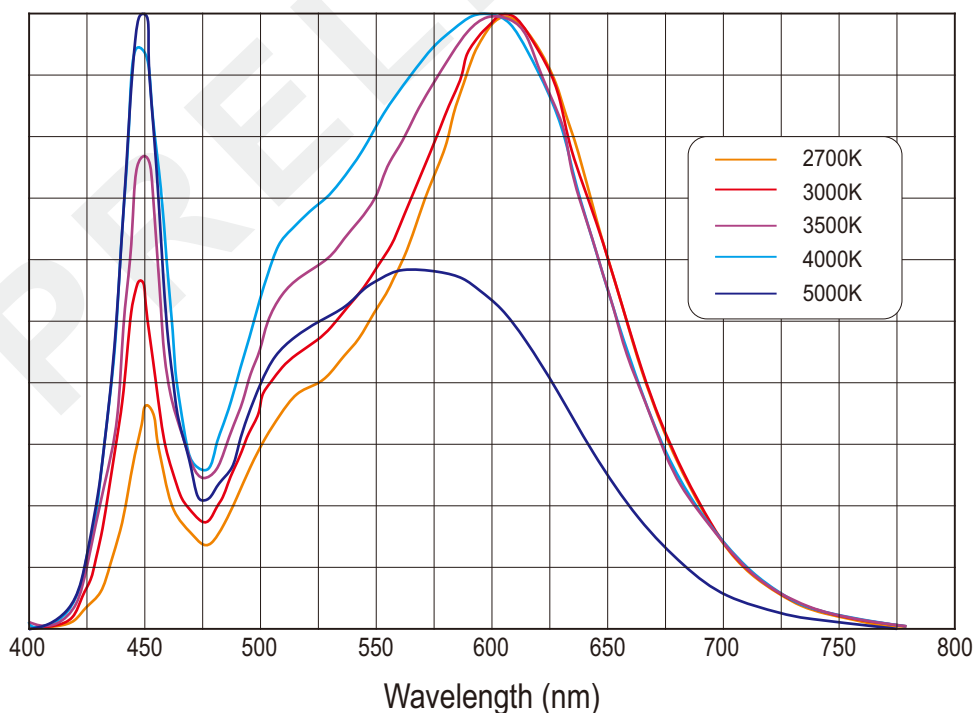


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Color and Binning

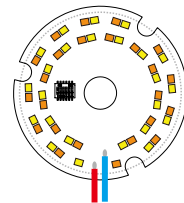


Optical Spectrum



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 032012RD9TWA

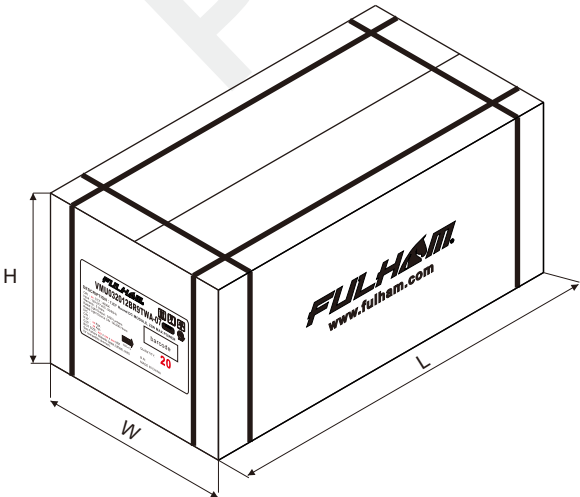
Product Line	Type	Control Type	Input Current	Typ. Power	Design	CRI	Color Temperature	Option
V = VividHorse	M = Module (UL Class 2)	U = None	032 = 320mA Max.	012 = 12W	RD = Round	8 = 80 9 = 90	8 = 80 9 = 90 TW = 2700K-5000K Tunable White	A = Standard

© CRI90 option is standard; CRI80 option is made to order with MOQ and lead time.

Product Image:

Packaging

Master Carton



TOP VIEW

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.