

# VM2240100RT8TWA

## 4" x 11" TUNABLE WHITE RECTANGULAR DC MODULE, 2400mA MAX PER CHANNEL

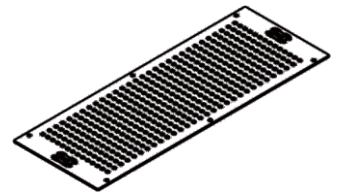
- 2 channels input, tunable white ranges from 2700K to 5000K
- Uniform, consistent light, superior color mixing effect
- Up to 100W mixed channels, high lumen output, high efficacy
- Compact and symmetric form factor, ease of system design
- Through board connector for minimum shadowing
- Suitable for High bay, Canopy and Flood applications
- Each channel for use in UL Class 2 lighting systems
- Suitable for DLC applications: L70>60,000hrs / L90=40,000hrs
- Meets UL8750 recognized
- RoHS compliant

### General Specifications

|                                                |                                                                                                               |
|------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| Input Voltage @max. input current <sup>①</sup> | Typ. 41.4VDC per channel                                                                                      |
| Input Current <sup>①</sup>                     | 2400mA max. per channel                                                                                       |
| Input Power @max. input current <sup>①</sup>   | 99.3W max. per channel                                                                                        |
| Initial Lumens @max. input current             | WW: 16,211 lumens CW: 17,677 lumens                                                                           |
| Initial Lm/W @max. input current               | WW: 163lm/W CW: 178 lm/W                                                                                      |
| Beam Angle                                     | 120°                                                                                                          |
| CRI                                            | 80CRI standard, 90CRI available                                                                               |
| 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)                  | L70: Tc max 105°C / L90: Tc max 105°C                                                                         |
| Estimated Lumen Maintenance <sup>②</sup>       | L70: >60,000Hrs / L90: 40,000Hrs                                                                              |
| Color Consistency                              | Binning per ANSI C78.377-2015 @ 25°C; 3 SDCM                                                                  |
| Overall Size                                   | 11" L x 4" W x 0.29" H (279.4mm x 101.6mm x 7.45mm)                                                           |
| PCB Material / Thermal Conductivity            | MCPCB (Aluminum Clad) 1.6mm, 1oz, 1.0W / mK                                                                   |
| LED Quantity                                   | 420pcs.                                                                                                       |
| Module Weight                                  | 130g / 0.286lb.                                                                                               |
| PCB Part Number                                | PTL044C01M1                                                                                                   |
| Maximum Screw Installation Torque              | 25 inch - ounces                                                                                              |
| Connector Type                                 | WAGO #2070-542 / 998-406 (2 pin through board connector)                                                      |
| Packaging: Master Carton                       | 40                                                                                                            |
| Thermal Feedback                               | Not Available                                                                                                 |
| Safety/Compliance                              | cURus (File # E351548)<br>Suitable for UL Class 2 Lighting Systems<br>RoHS Compliant<br>Dry and Damp Location |
| Energy Efficiency Label (EEI-Label)            | A++                                                                                                           |
| Warranty                                       | 5 years @ Max. Tc from the date of manufacture                                                                |

<sup>①</sup> Nominal ratings. Performance based on Tc mod = 25°C. See thermal de-rating chart (pg. 3) for higher temperature operation

<sup>②</sup> TM-21 Reported Numbers

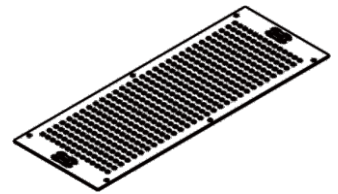


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## Electrical and Optical Specifications

| LED Module Part Number | Number of LED | Channel  | Input Current | Nom. Forward Voltage | Nom. Rated Power | Nom. Lum. Flux @2700K/80 CRI | Nom. Efficacy @2700K/80 CRI | Target CCT |
|------------------------|---------------|----------|---------------|----------------------|------------------|------------------------------|-----------------------------|------------|
| VMU240100RT8TWA        | 210           | CH1 (WW) | 300 mA        | 37.0 V               | 11.1 W           | 2236 lm                      | 201 lm/W                    | 2725 K     |
|                        |               |          | 400 mA        | 37.3 V               | 14.9 W           | 2967 lm                      | 199 lm/W                    |            |
|                        |               |          | 500 mA        | 37.6 V               | 18.8 W           | 3690 lm                      | 196 lm/W                    |            |
|                        |               |          | 600 mA        | 37.9 V               | 22.7 W           | 4406 lm                      | 194 lm/W                    |            |
|                        |               |          | 700 mA        | 38.1 V               | 26.7 W           | 5115 lm                      | 192 lm/W                    |            |
|                        |               |          | 800 mA        | 38.4 V               | 30.7 W           | 5817 lm                      | 189 lm/W                    |            |
|                        |               |          | 900 mA        | 38.6 V               | 34.8 W           | 6513 lm                      | 187 lm/W                    |            |
|                        |               |          | 1000 mA       | 38.8 V               | 38.8 W           | 7201 lm                      | 185 lm/W                    |            |
|                        |               |          | 1100 mA       | 39.1 V               | 43.0 W           | 7884 lm                      | 184 lm/W                    |            |
|                        |               |          | 1200 mA       | 39.3 V               | 47.1 W           | 8559 lm                      | 182 lm/W                    |            |
|                        |               |          | 1300 mA       | 39.5 V               | 51.3 W           | 9229 lm                      | 180 lm/W                    |            |
|                        |               |          | 1400 mA       | 39.6 V               | 55.5 W           | 9892 lm                      | 178 lm/W                    |            |
|                        |               |          | 1500 mA       | 39.8 V               | 59.8 W           | 10549 lm                     | 177 lm/W                    |            |
|                        |               |          | 1600 mA       | 40.0 V               | 64.0 W           | 11200 lm                     | 175 lm/W                    |            |
|                        |               |          | 1700 mA       | 40.2 V               | 68.3 W           | 11846 lm                     | 173 lm/W                    |            |
|                        |               |          | 1800 mA       | 40.4 V               | 72.7 W           | 12486 lm                     | 172 lm/W                    |            |
|                        |               |          | 1900 mA       | 40.5 V               | 77.0 W           | 13120 lm                     | 170 lm/W                    |            |
|                        |               |          | 2000 mA       | 40.7 V               | 81.4 W           | 13749 lm                     | 169 lm/W                    |            |
|                        |               |          | 2100 mA       | 40.9 V               | 85.8 W           | 14372 lm                     | 167 lm/W                    |            |
|                        |               |          | 2200 mA       | 41.0 V               | 90.3 W           | 14990 lm                     | 166 lm/W                    |            |
|                        |               |          | 2300 mA       | 41.2 V               | 94.8 W           | 15603 lm                     | 165 lm/W                    |            |
|                        |               |          | 2400 mA*      | 41.4 V               | 99.3 W           | 16211 lm                     | 163 lm/W                    |            |

| LED Module Part Number | Number of LED | Channel  | Input Current | Nom. Forward Voltage | Nom. Rated Power | Nom. Lum. Flux @5000K/80 CRI | Nom. Efficacy @5000K/80 CRI | Target CCT |
|------------------------|---------------|----------|---------------|----------------------|------------------|------------------------------|-----------------------------|------------|
| VMU240100RT8TWA        | 210           | CH2 (CW) | 300 mA        | 37.0 V               | 11.1 W           | 2439 lm                      | 220 lm/W                    | 5029 K     |
|                        |               |          | 400 mA        | 37.3 V               | 14.9 W           | 3235 lm                      | 217 lm/W                    |            |
|                        |               |          | 500 mA        | 37.6 V               | 18.8 W           | 4024 lm                      | 214 lm/W                    |            |
|                        |               |          | 600 mA        | 37.9 V               | 22.7 W           | 4805 lm                      | 211 lm/W                    |            |
|                        |               |          | 700 mA        | 38.1 V               | 26.7 W           | 5578 lm                      | 209 lm/W                    |            |
|                        |               |          | 800 mA        | 38.4 V               | 30.7 W           | 6343 lm                      | 207 lm/W                    |            |
|                        |               |          | 900 mA        | 38.6 V               | 34.8 W           | 7102 lm                      | 204 lm/W                    |            |
|                        |               |          | 1000 mA       | 38.8 V               | 38.8 W           | 7853 lm                      | 202 lm/W                    |            |
|                        |               |          | 1100 mA       | 39.1 V               | 43.0 W           | 8596 lm                      | 200 lm/W                    |            |
|                        |               |          | 1200 mA       | 39.3 V               | 47.1 W           | 9333 lm                      | 198 lm/W                    |            |
|                        |               |          | 1300 mA       | 39.5 V               | 51.3 W           | 10063 lm                     | 196 lm/W                    |            |
|                        |               |          | 1400 mA       | 39.6 V               | 55.5 W           | 10786 lm                     | 194 lm/W                    |            |
|                        |               |          | 1500 mA       | 39.8 V               | 59.8 W           | 11503 lm                     | 193 lm/W                    |            |
|                        |               |          | 1600 mA       | 40.0 V               | 64.0 W           | 12213 lm                     | 191 lm/W                    |            |
|                        |               |          | 1700 mA       | 40.2 V               | 68.3 W           | 12917 lm                     | 189 lm/W                    |            |
|                        |               |          | 1800 mA       | 40.4 V               | 72.7 W           | 13615 lm                     | 187 lm/W                    |            |
|                        |               |          | 1900 mA       | 40.5 V               | 77.0 W           | 14306 lm                     | 186 lm/W                    |            |
|                        |               |          | 2000 mA       | 40.7 V               | 81.4 W           | 14992 lm                     | 184 lm/W                    |            |
|                        |               |          | 2100 mA       | 40.9 V               | 85.8 W           | 15671 lm                     | 183 lm/W                    |            |
|                        |               |          | 2200 mA       | 41.0 V               | 90.3 W           | 16346 lm                     | 181 lm/W                    |            |
|                        |               |          | 2300 mA       | 41.2 V               | 94.8 W           | 17014 lm                     | 180 lm/W                    |            |
|                        |               |          | 2400 mA*      | 41.4 V               | 99.3 W           | 17677 lm                     | 178 lm/W                    |            |

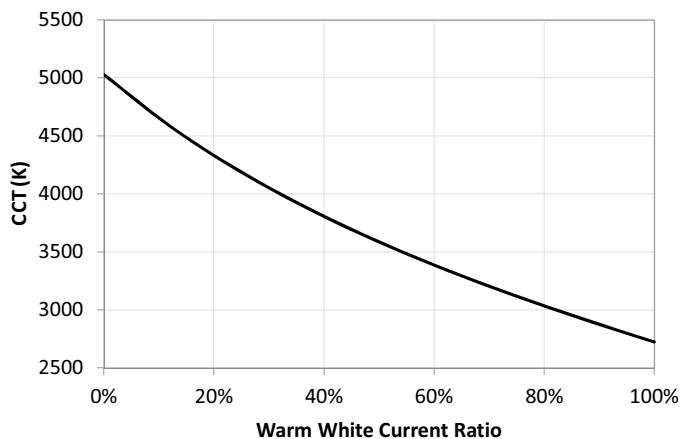


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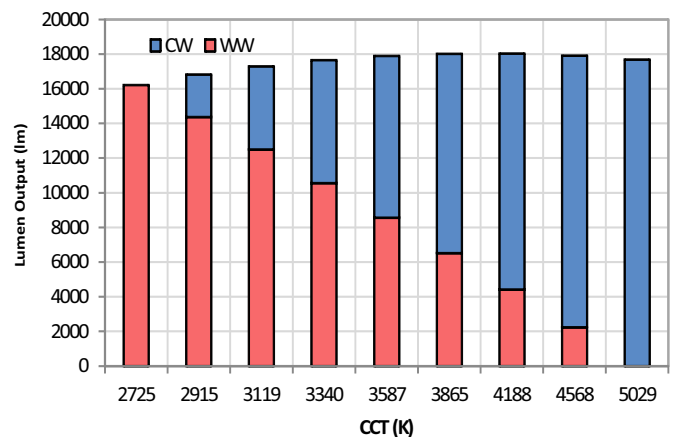
## Electrical and Optical Specifications

| LED Module Part Number | Number of LED         | Channel            | Input Current  | Nom. Forward Voltage | Nom. Rated Power | Nom. Lum. Flux  | Nom. Efficacy   | Target CCT |
|------------------------|-----------------------|--------------------|----------------|----------------------|------------------|-----------------|-----------------|------------|
| VMU240100RT8TWA        | 210 2700K + 210 5000K | CH1(WW)            | 2400 mA        | 41.4 V               | 99.3 W           | 16211 lm        | 163 lm/W        | 2725 K     |
|                        |                       | CH2(CW)            | 0 mA           | 0.0 V                | 0.0 W            | 0 lm            | N/A             |            |
|                        |                       | <b>Mixed Total</b> | <b>2400 mA</b> | <b>N/A</b>           | <b>99.3 W</b>    | <b>16211 lm</b> | <b>163 lm/W</b> |            |
|                        |                       | CH1(WW)            | 2100 mA        | 40.9 V               | 85.8 W           | 14372 lm        | 167 lm/W        | 2910 K     |
|                        |                       | CH2(CW)            | 300 mA         | 37.0 V               | 11.1 W           | 2439 lm         | 220 lm/W        |            |
|                        |                       | <b>Mixed Total</b> | <b>2400 mA</b> | <b>N/A</b>           | <b>96.9 W</b>    | <b>16811 lm</b> | <b>173 lm/W</b> |            |
|                        |                       | CH1(WW)            | 1800 mA        | 40.4 V               | 72.7 W           | 12486 lm        | 172 lm/W        | 3110 K     |
|                        |                       | CH2(CW)            | 600 mA         | 37.9 V               | 22.7 W           | 4805 lm         | 211 lm/W        |            |
|                        |                       | <b>Mixed Total</b> | <b>2400 mA</b> | <b>N/A</b>           | <b>95.4 W</b>    | <b>17290 lm</b> | <b>181 lm/W</b> |            |
|                        |                       | CH1(WW)            | 1500 mA        | 39.8 V               | 59.8 W           | 10549 lm        | 177 lm/W        | 3328 K     |
|                        |                       | CH2(CW)            | 900 mA         | 38.6 V               | 34.8 W           | 7102 lm         | 204 lm/W        |            |
|                        |                       | <b>Mixed Total</b> | <b>2400 mA</b> | <b>N/A</b>           | <b>94.5 W</b>    | <b>17651 lm</b> | <b>187 lm/W</b> |            |
|                        |                       | CH1(WW)            | 1200 mA        | 39.3 V               | 47.1 W           | 8559 lm         | 182 lm/W        | 3571 K     |
|                        |                       | CH2(CW)            | 1200 mA        | 39.3 V               | 47.1 W           | 9333 lm         | 198 lm/W        |            |
|                        |                       | <b>Mixed Total</b> | <b>2400 mA</b> | <b>N/A</b>           | <b>94.2 W</b>    | <b>17893 lm</b> | <b>190 lm/W</b> |            |
|                        |                       | CH1(WW)            | 900 mA         | 38.6 V               | 34.8 W           | 6513 lm         | 187 lm/W        | 3849 K     |
|                        |                       | CH2(CW)            | 1500 mA        | 39.8 V               | 59.8 W           | 11503 lm        | 193 lm/W        |            |
|                        |                       | <b>Mixed Total</b> | <b>2400 mA</b> | <b>N/A</b>           | <b>94.5 W</b>    | <b>18016 lm</b> | <b>191 lm/W</b> |            |
|                        |                       | CH1(WW)            | 600 mA         | 37.9 V               | 22.7 W           | 4406 lm         | 194 lm/W        | 4173 K     |
|                        |                       | CH2(CW)            | 1800 mA        | 40.4 V               | 72.7 W           | 13615 lm        | 187 lm/W        |            |
|                        |                       | <b>Mixed Total</b> | <b>2400 mA</b> | <b>N/A</b>           | <b>95.4 W</b>    | <b>18021 lm</b> | <b>189 lm/W</b> |            |
|                        |                       | CH1(WW)            | 300 mA         | 37.0 V               | 11.1 W           | 2236 lm         | 201 lm/W        | 4558 K     |
|                        |                       | CH2(CW)            | 2100 mA        | 40.9 V               | 85.8 W           | 15671 lm        | 183 lm/W        |            |
|                        |                       | <b>Mixed Total</b> | <b>2400 mA</b> | <b>N/A</b>           | <b>96.9 W</b>    | <b>17908 lm</b> | <b>185 lm/W</b> |            |
|                        |                       | CH1(WW)            | 0 mA           | 0.0 V                | 0.0 W            | 0 lm            | N/A             | 5029 K     |
|                        |                       | CH2(CW)            | 2400 mA        | 41.4 V               | 99.3 W           | 17677 lm        | 178 lm/W        |            |
|                        |                       | <b>Mixed Total</b> | <b>2400 mA</b> | <b>N/A</b>           | <b>99.3 W</b>    | <b>17677 lm</b> | <b>178 lm/W</b> |            |

CCT vs. Warm White Current Ratio

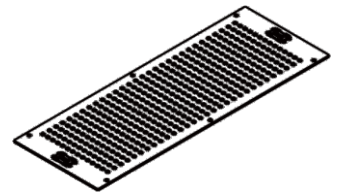


Lumen Output vs. CCT



### NOTES:

- 1) Performance based on Tc mod = 25°C. See thermal de-rating chart (pg. 4) for higher temperature operation
- 2) Specifications are subject to change without notice.
- 3) Modules may be operated at a current less than or equal to maximum rated current, below the Tc rating.



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## Thermal Specifications

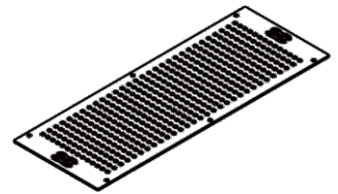
### DC Module

|                                          |                                           |
|------------------------------------------|-------------------------------------------|
| Storage Temperature Range                | -40 to +100°C / -40 to +212°F             |
| Operating Ambient Temperature Range (ta) | -40 to 55°C / -40 to 131°F                |
| Maximum Case Temperature (Tc)            | L70 = 105°C (221°F) / L90 = 105°C (221°F) |

## Thermal De-Rating

### 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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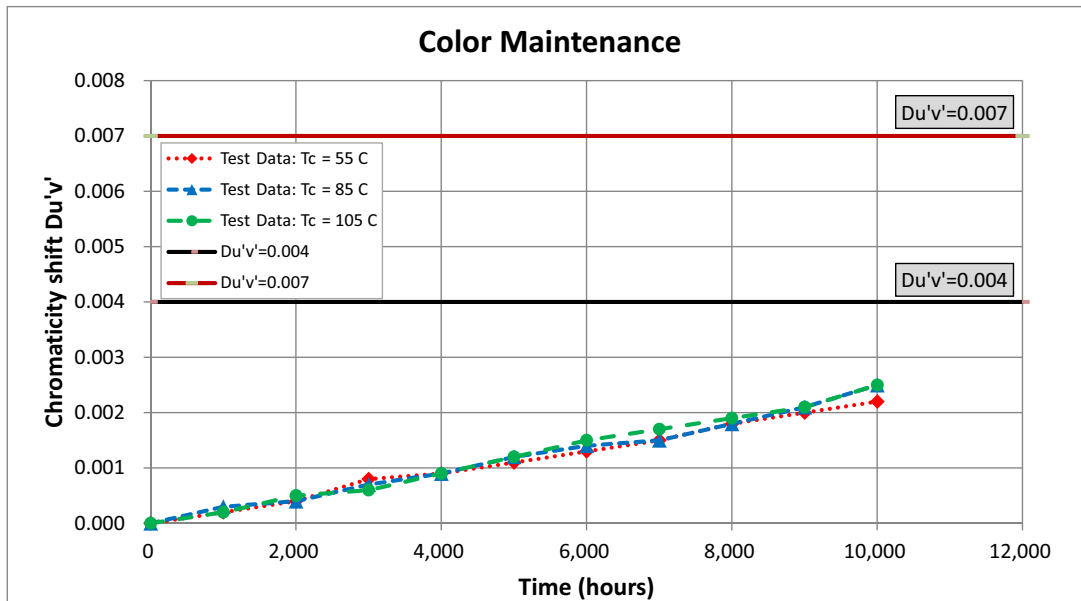
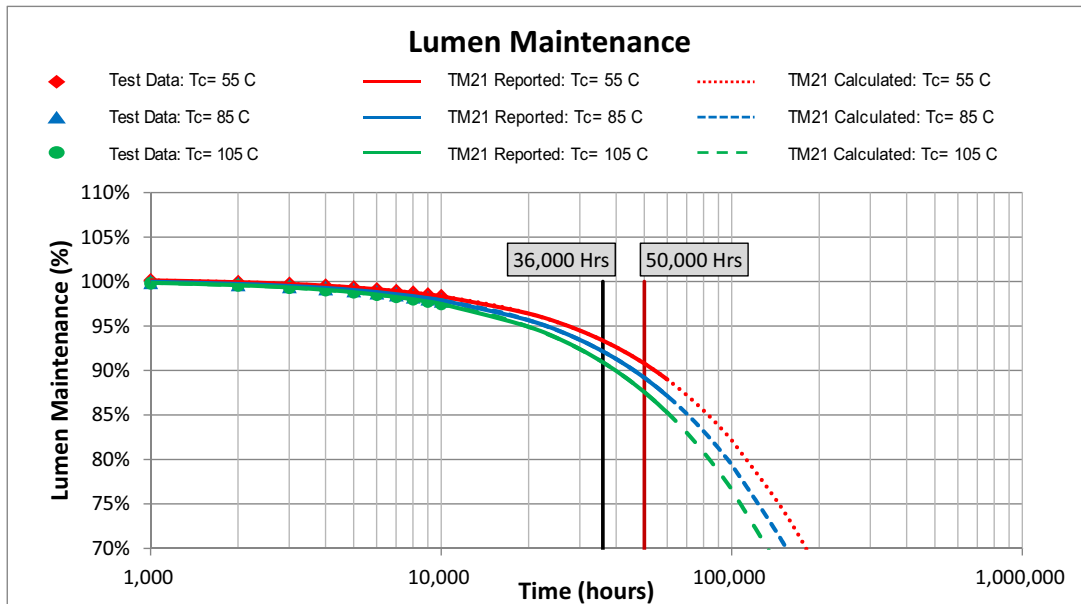
## Certification Chart

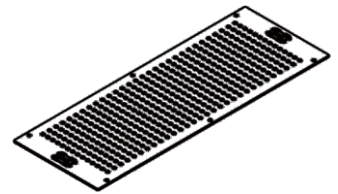
| Classification                                 | Model           |
|------------------------------------------------|-----------------|
|                                                | VM2240200RT8xxA |
| <b>RoHS COMPLIANT</b>                          | YES             |
| <b>cULUS</b>                                   | YES             |
| <b>CE</b>                                      | Pending         |
| <b>Energy Efficiency Label (EEI-Label)</b>     | A++             |
| <b>Suitable for UL Class 2 Lighting System</b> | YES             |

## Energy Star™ TM-21 Calculator Data

| Tc Module | Reported L70   | Reported L90   |
|-----------|----------------|----------------|
| 55°C      | >60,000 Hrs    | 54,000 Hrs     |
| 85°C      | >60,000 Hrs    | 46,000 Hrs     |
| 105°C     | >60,000 Hrs    | 40,000 Hrs     |
| Tc Module | Calculated L70 | Calculated L90 |
| 55°C      | 180,000 Hrs    | 54,000 Hrs     |
| 85°C      | 154,000 Hrs    | 46,000 Hrs     |
| 105°C     | 133,000 Hrs    | 40,000 Hrs     |

## LED Lumen & Color Maintenance Data per LM-80 report & TM-21 Calculation

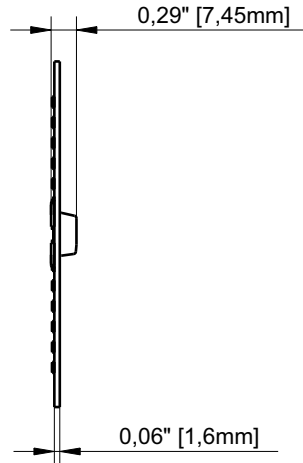




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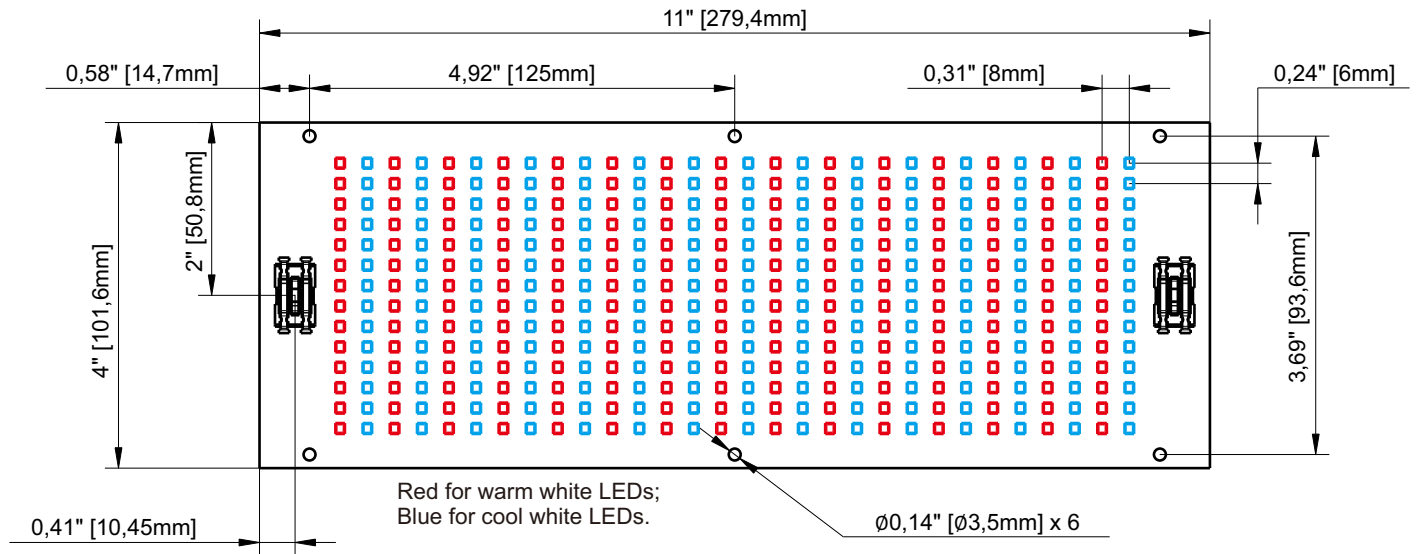
## Mechanical Drawings

4" x 11"



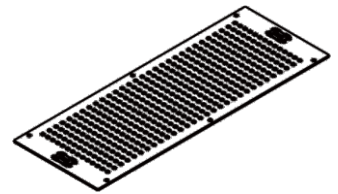
SIDE VIEW

| Overall Dimensions |                   |
|--------------------|-------------------|
| Length             | 11"<br>[279.4mm]  |
| Width              | 4"<br>[101.6mm]   |
| Height             | 0.29"<br>[7.45mm] |



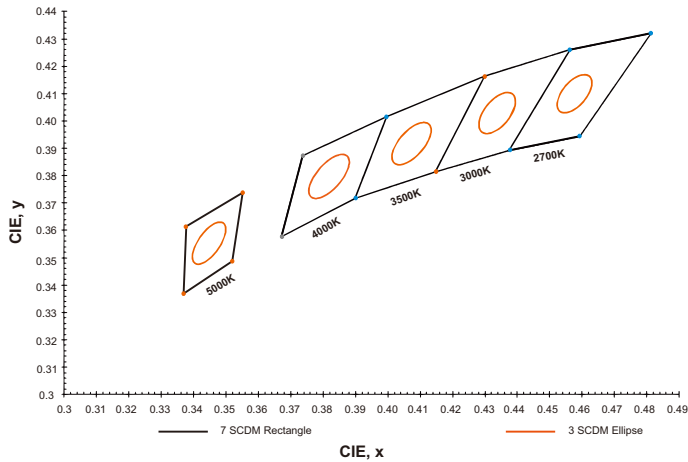
PCB & Heatsink opening for connector:  
0.512" x 0.43" [13mmx10.9mm]

TOP VIEW

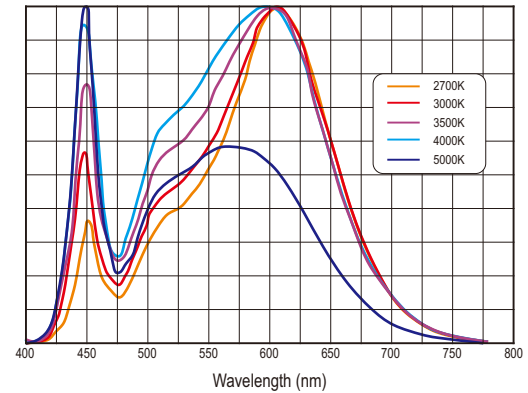


# VM2240100RT8TWA

## Color and Binning



## Optical Spectrum



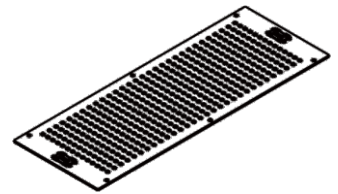
## Compatible Fulham Drivers

(Please use the links below for a complete list of compatible Fulham drivers and wiring diagrams)

- LP-LinearHO System Combination:
- Fulham's Wiring Diagrams: <https://cdn.fulham.com/PDFs/SpecSheets/DC-Modules-Wiring-Diagrams.pdf>
- Compatible with Fulham Hotspot EM Systems.

## 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.
- 4) Driver not included.
- 5) Do not connect LinearHO Modules in parallel (end to end) if the current exceeds the maximum module rated current. This type of wiring would cause the pass-through current on the first module to exceed the rated current. This setup is in reference to wiring diagram #2 per Fulham's wiring diagram (see the link above). If the current is higher than the rated max, it is recommended to use wiring diagram #3.

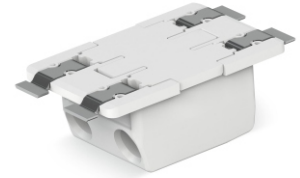


# VM2240100RT8TWA

## Guidelines

### Termination Notes

- Connector Type: WAGO #2070-542 / 998-406 (2 pin through board connector)
  - AWG: 24...18 solid wire
  - Strip length: 8...10mm / 0.315...0.394in
  - Connector Max amp. rating: 9 Amps.



For more detail information, please visit Wago's website:

### Fastening Notes

- 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.

### Environmental Rating / Conformal Coating

- 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.
- Fulham's DC modules are available with conformal coating; made to order with MOQ and lead time will apply. The conformal coating is a silicone based material which is double sprayed on the module only (LEDs and PCB). Conformal coating is recommended for the following applications: near ocean where salt is present, constant moisture, refrigeration, continuously high humidity, or outdoor applications. An IP rating of IP64 or IP65 is achieved when the conformal coating is used, but other factors should be considered. Fulham still recommends the luminaire also meet an IP64/65 rating.

### 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.

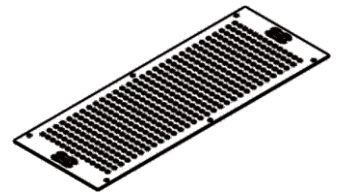
### Thermal Management

- 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.





VM2240100RT8TWA



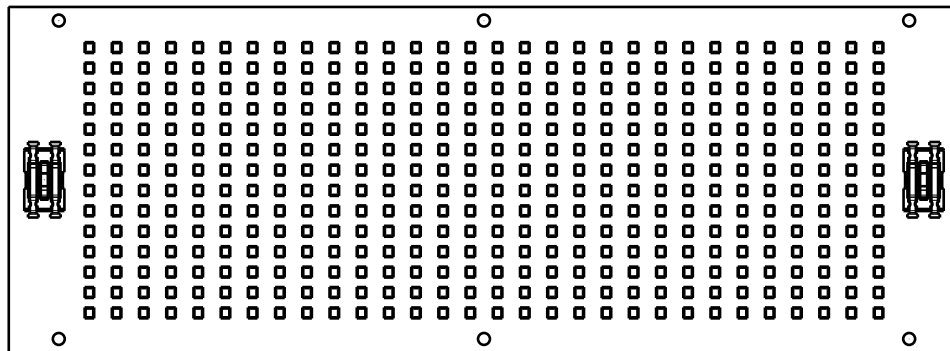
Part Number Matrix

**V** **M** **2** **240** **100** **RT** **8** **TW** **A**

| Product Line | Type                       | Output Channel | Input Current                    | Max. Power | Design         | CRI              | Color Temperature                                                       | Option                                            |
|--------------|----------------------------|----------------|----------------------------------|------------|----------------|------------------|-------------------------------------------------------------------------|---------------------------------------------------|
| V = Vizion   | M = Module<br>(UL Class 2) | 2 = 2 Channles | 240 = 2400mA Max.<br>per channel | 100 = 100W | RT=Rectangular | 8 = 80<br>9 = 90 | TW = 2700K-5000K<br>Tunable White<br>EW = 2700K-6500K<br>Extended White | A = Standard<br>D = Conformal<br>Coating<br>(MTO) |

- Ⓢ All CCT, CRI options are made to order with MOQ and lead time  
Ⓢ See page #8 for Conformal Coating information. Made to order (MTO).

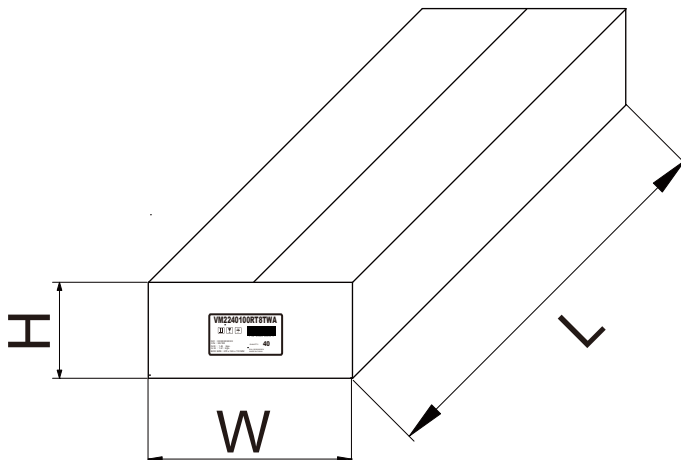
Product Image:



TOP VIEW

Packaging

Master Carton



| OUTER DIMENSION         |                        |               |
|-------------------------|------------------------|---------------|
| L                       | W                      | H             |
| 15.55"(395 mm)          | 14.57"(370 mm)         | 9.84"(250 mm) |
| Net Weight              | Gross Weight           | QUANTITY      |
| 11.44 lbs.<br>(5.19 kg) | 18.5 lbs.<br>(8.39 kg) | 40pcs.        |