

MVL-934HUOLC
MVL-934UOLC
MVL-934HUYLC
MVL-934UYLC
MVL-934TUOLC
MVL-934TUYLC
MVL-934TGC / UTGC
MVL-934SGC / USGC
MVL-934BC / UBC
MVL-934W / UW

MVL-934HTGC
MVL-934HSGC
MVL-934HBC
MVL-934HW

Technical Data JACK LEDs

11/15/2001

Benefits

- Fewer LEDs Required
- Lowers Lighting System Cost

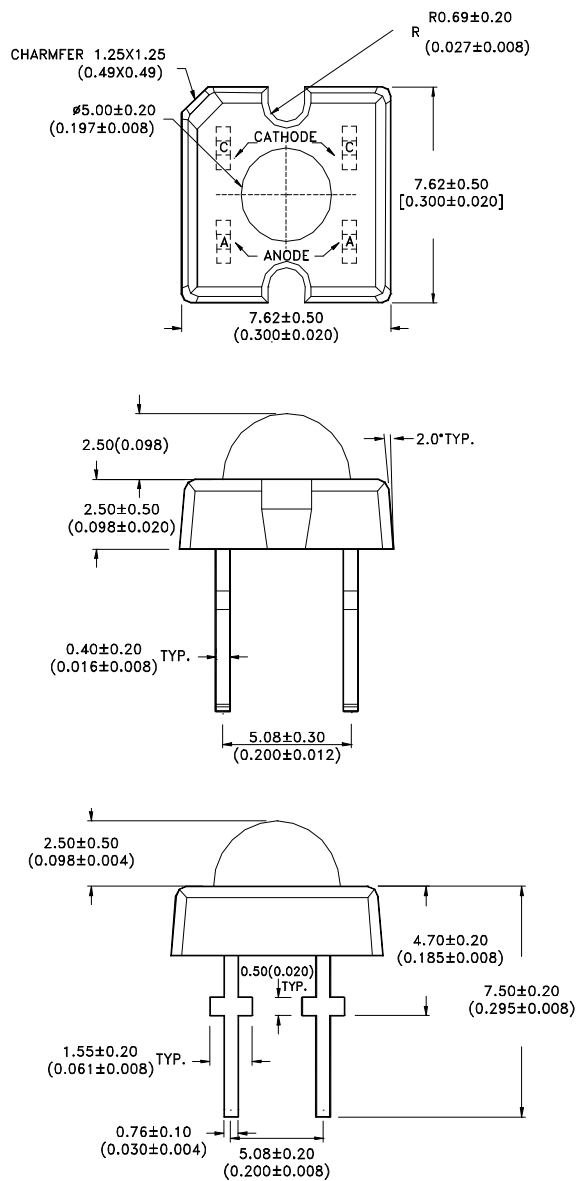
Features

- High Flux Output
- Designed for High Current Operation
- Low Thermal Resistance
- Low Profile
- Reliable
- Packaged in Tubes for Use with Automatic Insertion Equipment

Applications

- Automotive Exterior Lighting
- Electronic Signs and Signals
- Traffic Signal
- Sign

Outline Drawing



NOTES : 1.DIMENSIONS ARE IN MILLIMETERS (INCHES).
2.DIMENSIONS WITHOUT TOLERANCES ARE NOMINAL.

Device Selection Guide

| Part Number | LED Color | Total Flux qv(mlm) Typ. | View Angle 2q1/2 (Degrees) Typ. |
|----------------------|-----------------------|-----------------------------------|------------------------------------|
| MVL-934HUOLC | AS AlInGaP Red-Orange | 2000 @I _F =70mA | 73 |
| MVL-934UOLC | | 1200 @I _F =50mA | 75 |
| MVL-934HUYLEC | AS AlInGaP Amber | 2000 @I _F =70mA | 73 |
| MVL-934UYLC | | 1200 @I _F =50mA | 75 |
| MVL-934TUOLC | TS AlInGaP Red | 3000 @I _F =70mA | 63 |
| MVL-934TUYLEC | TS AlInGaP Amber | 3000 @I _F =70mA | 63 |
| MVL-934TGC / 934UTGC | InGaN True Green | 700 / 1100 @I _F =40mA | 53 |
| MVL-934SGC / 934USGC | InGaN Signal Green | 600 / 1000 @I _F =40mA | 53 |
| MVL-934BC / 934UBC | InGaN Blue | 500 / 900 @I _F =40mA | 53 |
| MVL-934W / 934UW | White | 1200 / 2000 @I _F =40mA | 58 |
| MVL-934HTGC | InGaN True Green | 500 @I _F =20mA | 53 |
| MVL-934HSGC | InGaN Signal Green | 400 @I _F =20mA | 53 |
| MVL-934HBC | InGaN Blue | 300 @I _F =20mA | 53 |
| MVL-934HW | White | 1000 @I _F =20mA | 60 |

Absolute Maximum Ratings at T_A=25°C

| Parameter | Device Type | | | | | | Units |
|---|--|-------------------------------|----------------------------|--|---|----|-------|
| | MVL-934HUOLC MVL-934HUYLEC | MVL-934TUOLC MVL-934TUYLEC | MVL-934UOLC MVL-934UYLC | MVL-934(U)TGC MVL-934(U)SG MVL-934(U)BC MVL-934(U)W | MVL-934HTGC MVL-934HSGC MVL-934HBC MVL-934HW | | |
| DC Forward Current | 70 | 70 | 50 | 40 | 20 | mA | |
| Power Dissipation | 150 | 182 | 120 | 140 | 74 | mW | |
| Reverse Voltage (I _R =100μA) | 10 | 10 | 10 | 5 | 5 | V | |
| LED Junction Temperature | 125 | 125 | 125 | 125 | 125 | °C | |
| Operating Temp Range | -20 to +80 | | | | | °C | |
| Storage Temp | -30 to +100 | | | | | °C | |
| Solder Conditions | | | | | | | |
| Preheat Temperature | 100°C for 30 seconds | | | | | | |
| Solder Temperature | 260°C for 5 seconds | | | | | | |
| | [1.5mm (0.06 in.) below seating plane] | | | | | | |

Optical Characteristics at T_A=25°C

| Part Number | Total Flux f _v (mIm) | | Peak Wavelength l peak (nm) Typ. | Color, Dominant Wavelength l d (nm) Typ. | Viewing Angle 2q 1/2 (Degrees) Typ. |
|-------------------|------------------------------------|----------------------------------|---|--|---|
| | Min. | Typ. | | | |
| MVL-934HUOLC | 600 @I _F =70mA | 2000 @I _F =70mA | 630 | 625 | 73 |
| MVL-934HUYLC | 600 @I _F =70mA | 2000 @I _F =70mA | 592 | 590 | 73 |
| MVL-934TUOLC | 600 @I _F =70mA | 3000 @I _F =70mA | 640 | 630 | 63 |
| MVL-934TUYLEC | 600 @I _F =70mA | 3000 @I _F =70mA | 594 | 592 | 63 |
| MVL-934UOLC | 100 @I _F =50mA | 1200 @I _F =50mA | 630 | 625 | 75 |
| MVL-934UYLC | 100 @I _F =50mA | 1200 @I _F =50mA | 592 | 590 | 75 |
| MVL-934TGC / UTGC | 100 / 200 @I _F =40mA | 700 / 1100 @I _F =40mA | 523 | 525 | 53 |
| MVL-934SGC / USGC | 100 / 200 @I _F =40mA | 600 / 1000 @I _F =40mA | 502 | 505 | 53 |
| MVL-934BC / UBC | 100 / 200 @I _F =40mA | 500 / 900 @I _F =40mA | 468 | 470 | 53 |
| MVL-934HTGC | 100 @I _F =20mA | 500 @I _F =20mA | 523 | 525 | 53 |
| MVL-934HSGC | 100 @I _F =20mA | 400 @I _F =20mA | 502 | 505 | 53 |
| MVL-934HBC | 100 @I _F =20mA | 300 @I _F =20mA | 468 | 470 | 53 |

| Part Number | Total Flux f _v (mIm) | | Chromaticity Coordinates (Typ.) | |
|------------------|------------------------------------|-----------------------------------|---------------------------------|------|
| | Min. | Typ. | X | Y |
| MVL-934W / 934UW | 600 / 700 @I _F =40mA | 1200 / 2000 @I _F =40mA | 0.33 | 0.31 |
| MVL-934HW | 300 @I _F =20mA | 1000 @I _F =20mA | 0.33 | 0.31 |

Electrical Characteristics at T_A=25°C

| Device Type | Forward Voltage V _F (Volts) | | | Reverse Breakdown V _R (Volts) @I _R =100mA | | Thermal Resistance R _{θJ-PIN} (°C/W) | Thermal Resistance R _{θJ-A} (°C/W) |
|---|--|-------------------------------|------|--|------|---|---|
| | Min. | Typ. | Max | Min. | Typ. | Typ. | Typ. |
| MVL-934HUOLC MVL-934HUYLC | 1.83 | 2.2 @I _F =70mA | 2.79 | 10 | 20 | 120 | 250 |
| MVL-934UOLC MVL-934UYLC | 1.83 | 2.15 @I _F =50mA | 2.79 | 10 | 20 | 120 | 250 |
| MVL-934TUOLC MVL-934TUYLEC | 2.07 | 2.5 @I _F =70mA | 3.15 | 10 | 20 | 125 | 250 |
| MVL-934(U)TGC MVL-934(U)SGC MVL-934(U)BC MVL-934(U)W | 3 | 3.7 @I _F =40mA | 5.2 | 5 | 10 | 90 | 180 |
| MVL-934HTGC MVL-934HSGC MVL-934HBC MVL-934HW | 3 | 3.7 @I _F =20mA | 4.0 | 5 | 10 | 90 | 180 |

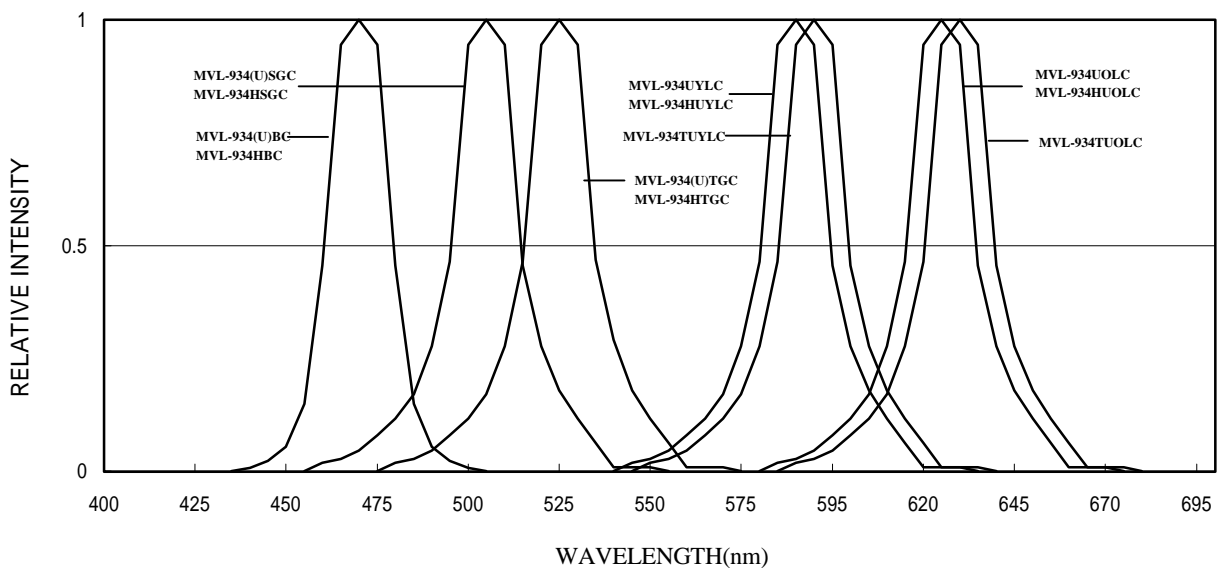


Figure 1. Relative Intensity vs. Wavelength.

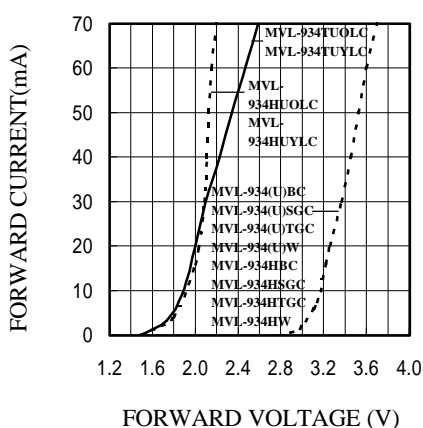


Figure 2. Forward Current vs. Forward Voltage.

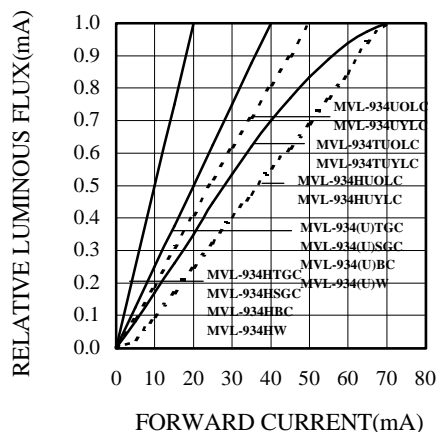


Figure 3. Relative Luminous Flux vs. Forward Current.

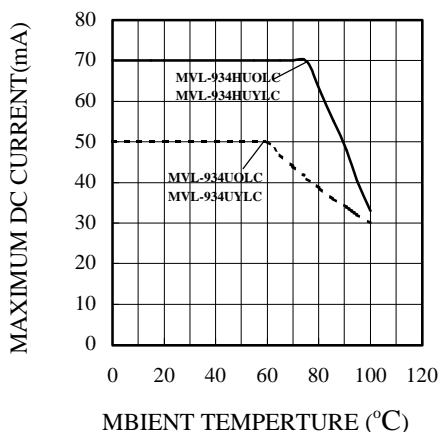


Figure 4a. Maximum DC Forward Current vs. Ambient Temperature.

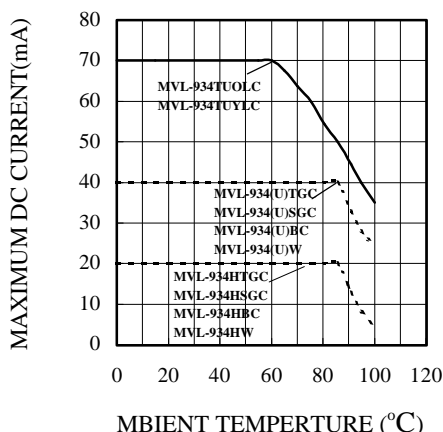


Figure 4b. Maximum DC Forward Current vs. Ambient Temperature.

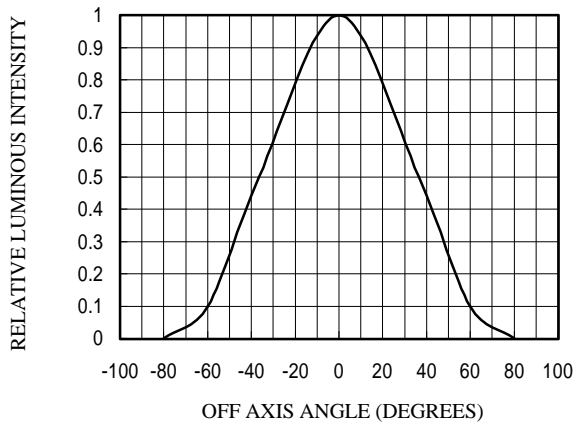


Figure 5. MVL-934HUOLC, MVL-934HUYLC
Relative Luminous Intensity vs. Off Axis Angle.

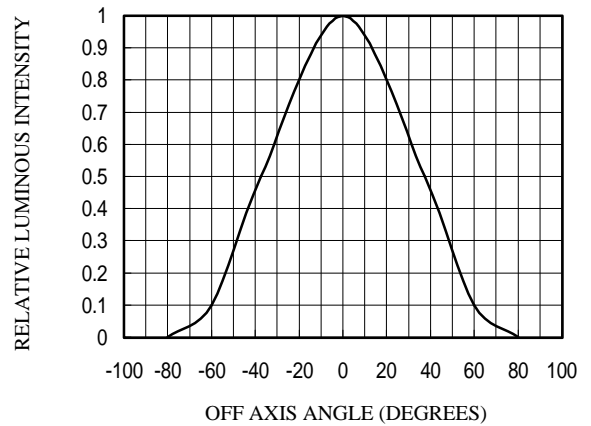


Figure 6. MVL-934UOLC, MVL-934UYLC
Relative Luminous Intensity vs. Off Axis Angle.

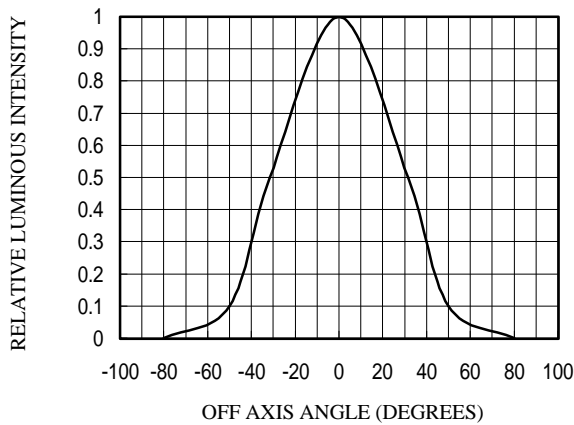


Figure 7. MVL-934TUOLC, MVL-934TUYLC
Relative Luminous Intensity vs. Off Axis Angle.

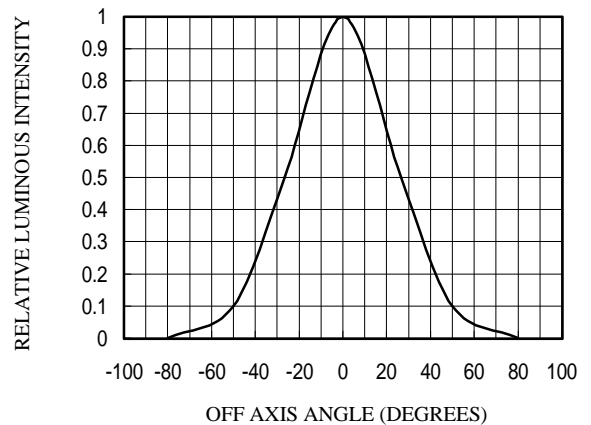


Figure 8. MVL-934TGC, MVL-934UTGC, MVL-934SGC,
MVL-934USGC, MVL-934BC, MVL-934UBC,
MVL-934HTGC, MVL-934HSGC, MVL-934HBC
Relative Luminous Intensity vs. Off Axis Angle.

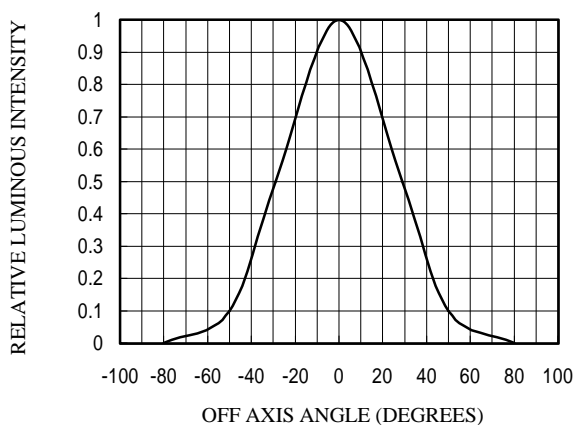


Figure 9. MVL-934UW, MVL-934W
Relative Luminous Intensity vs. Off Axis Angle.

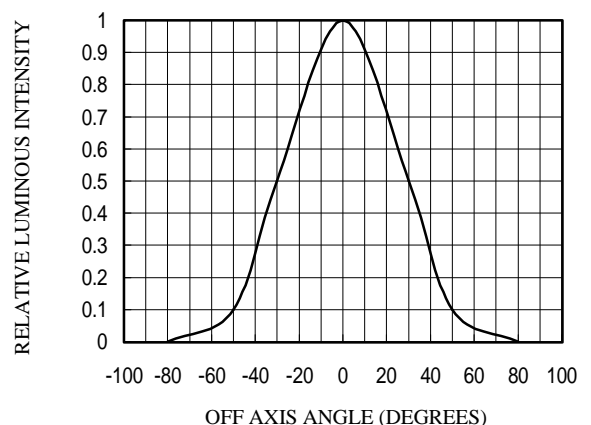


Figure 10. MVL-934HW
Relative Luminous Intensity vs. Off Axis Angle.

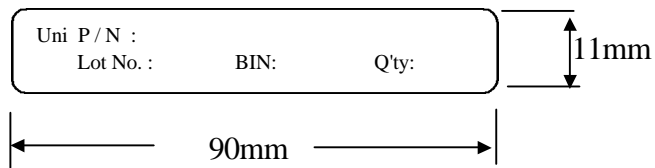
Packaging

Tubes of LEDs

LEDs are packaged in tubes , each of which contains 60 LEDs.

The LEDs in any individual tube come from a single category code.

Figure 1. Shows a sample label taken from a tube.



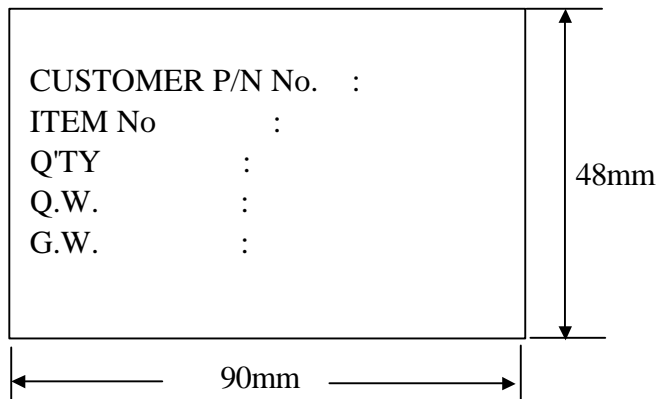
Boxes of LEDs

Each box of LEDs contains 240 tubes , or 14400 LEDs.

The box dimensions are 500×243×150mm(L×W×H)

All of the tubes are in the same orientation .

Figure 2. Shows a sample label taken from a box .



Unity Piranha LED Bin Codes

| Category Code | | |
|---------------|----------|----------|
| C | 2 | 3 |

| Luminous Flux (Light -out put in lumens) | | | | |
|--|---|------------|---|------------|
| | MVL-9X4HUOLC MVL-9X4HUYLEC MVL-9X4TUOLC MVL-9X4TUYL C@I _f =70mA | | MVL-9X4(U)TGC MVL-9X4(U)SGC MVL-9X4(U)BC @ I _f =40mA | |
| | MVL-9X4UOLC MVL-9X4UYLC@I _f =50mA | | MVL-9X4HTGC MVL-9X4HSGC MVL-9X4HBC @ I _f =20mA | |
| BIN CODE | minimum | maximum | minimum | maximum |
| A | 0.6 | 1.2 | 0.1 | 0.9 |
| B | 1.0 | 1.8 | 0.5 | 1.4 |
| C | 1.5 | 2.4 | 1.0 | 1.9 |
| D | 2.0 | 3.0 | 1.5 | 2.4 |
| E | 2.5 | 3.6 | 2.0 | 2.9 |
| F | 3.0 | 4.2 | 2.5 | 3.0 |
| G | 3.5 | 4.8 | | |
| H | 4.0 | 6.1 | | |

| Dominant Wavelength (in nanometers) @ I _f =20mA | | | | | | | | | | |
|--|------------------|------------|------------------|------------|-------------|------------|-------------|------------|------------|------------|
| | TUOLC,HUOLC,UOIC | | TUYLC,HUYLC,UYLC | | (U)TGC,HTGC | | (U)SGC,HSGC | | (U)BC,HBC | |
| Bin code | minimum | maximum | minimum | maximum | minimum | maximum | minimum | maximum | minimum | maximum |
| 1 | 611 | 618 | 583 | 589 | 517 | 528 | 495 | 504 | 459 | 469 |
| 2 | 614 | 622 | 587 | 593 | 524 | 535 | 500 | 509 | 467 | 475 |
| 3 | 616 | 634 | 591 | 597 | 531 | 542 | 505 | 514 | 471 | 481 |
| | | | | | | | | | | |

| Forward Voltage (Volts) | | | | |
|-------------------------|---|-------------|---|------------|
| | MVL-9X4HUOLC MVL-9X4HUYLEC MVL-9X4TUOLC MVL-9X4TUYLC @I _f =70mA | | MVL-9X4(U)TGC MVL-9X4(U)SGC MVL-9X4(U)BC @ I _f =40mA | |
| | MVL-9X4UOLC MVL-9X4UYLC @I _f =50mA | | MVL-9X4HTGC MVL-9X4HSGC MVL-9X4HBC @ I _f =20mA | |
| BIN CODE | minimum | maximum | minimum | maximum |
| 0 | 1.83 | 2.07 | 3.0 | 3.4 |
| 1 | 1.95 | 2.19 | 3.2 | 3.6 |
| 2 | 2.07 | 2.31 | 3.4 | 3.8 |
| 3 | 2.19 | 2.43 | 3.6 | 4.0 |
| 4 | 2.31 | 2.55 | 3.8 | 4.2 |
| 5 | 2.43 | 2.67 | 4.0 | 4.4 |
| 6 | 2.55 | 2.79 | 4.2 | 4.6 |
| 7 | 2.67 | 2.91 | 4.4 | 4.8 |
| 8 | 2.79 | 3.03 | 4.6 | 5.0 |
| 9 | 2.91 | 3.15 | 4.8 | 5.2 |

Unity JACK White LED Bin Codes

| Category Code | | |
|---------------|----------|----------|
| C | 2 | 3 |

| Luminous Flux (Light-output in lumens) | | |
|--|--|------------|
| | MVL-9X4W MVL-9X4UW @ I _F =40mA MVL-9X4HW @ I _F =20mA | |
| BIN CODE | minimum | maximum |
| A | 0.6 | 1.2 |
| B | 1.0 | 1.8 |
| C | 1.5 | 2.4 |
| D | 2.0 | 3.0 |
| E | 2.5 | 3.6 |
| F | 3.0 | 4.2 |
| G | 3.5 | 4.8 |
| H | 4.0 | 6.1 |

| Chromaticity Coordinates @ I _F =20mA | | | | | | | | |
|---|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Bin Code | 1 | | 2 | | 3 | | 4 | |
| | X | Y | X | Y | X | Y | X | Y |
| 1 | 0.44 | 0.484 | 0.388 | 0.344 | 0.351 | 0.314 | 0.378 | 0.452 |
| 2 | 0.378 | 0.452 | 0.351 | 0.314 | 0.335 | 0.292 | 0.332 | 0.417 |
| 3 | 0.332 | 0.417 | 0.335 | 0.292 | 0.323 | 0.275 | 0.303 | 0.388 |
| 4 | 0.303 | 0.388 | 0.323 | 0.275 | 0.303 | 0.243 | 0.256 | 0.338 |
| 5 | 0.256 | 0.338 | 0.303 | 0.243 | 0.292 | 0.222 | 0.221 | 0.293 |

| Forward Voltage (Volts) | | |
|-------------------------|--|------------|
| | MVL-9X4W MVL-9X4UW @ I _F =40mA MVL-9X4HW @ I _F =20mA | |
| BIN CODE | minimum | maximum |
| 0 | 3.0 | 3.4 |
| 1 | 3.2 | 3.6 |
| 2 | 3.4 | 3.8 |
| 3 | 3.6 | 4.0 |
| 4 | 3.8 | 4.2 |
| 5 | 4.0 | 4.4 |
| 6 | 4.2 | 4.6 |
| 7 | 4.4 | 4.8 |
| 8 | 4.6 | 5.0 |
| 9 | 4.8 | 5.2 |