

MVL-974HUOLC
MVL-974UOLC
MVL-974HUYLC
MVL-974UYLC
MVL-974TUOLC
MVL-974TUYLC
MVL-974MTGC / 974HTGC
MVL-974MSGC / 974HSGC
MVL-974MBC / 974HBC
MVL-974MW / 974HW

Technical Data

JACK LEDs

11/19/2003

Benefits

- Fewer LEDs Required
- Lowers Lighting System Cost

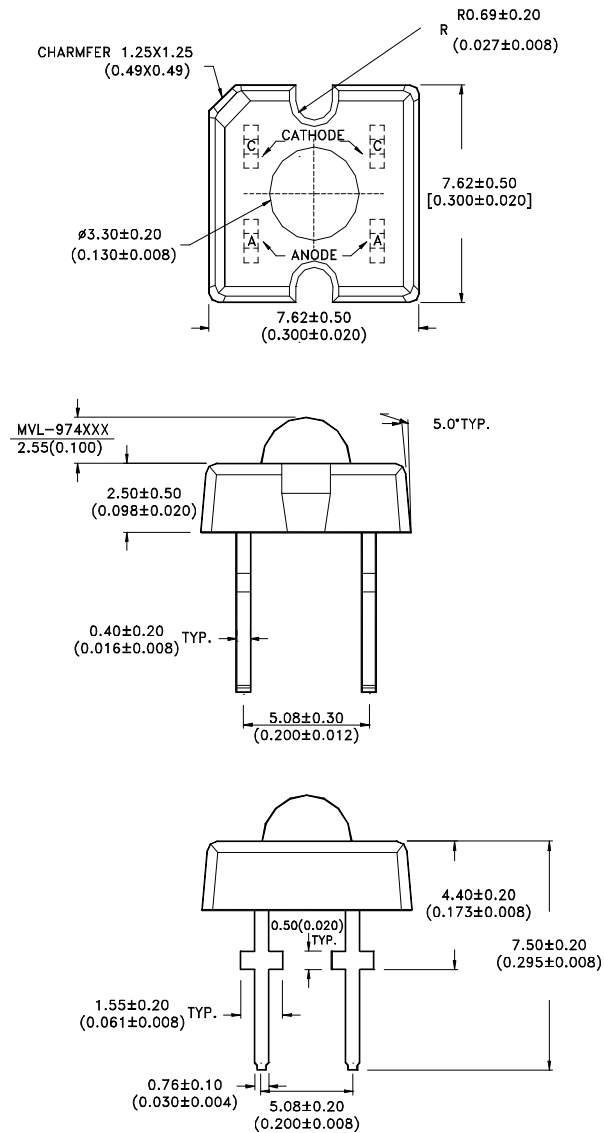
Features

- 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-974HUOLC | AS AlInGaP Red-Orange | 2500 @I _F =70mA | 30 |
| MVL-974UOLC | | 1700 @I _F =50mA | 30 |
| MVL-974HUYLEC | AS AlInGaP Amber | 2500 @I _F =70mA | 30 |
| MVL-974UYLC | | 1700 @I _F =50mA | 30 |
| MVL-974TUOLC | TS AlInGaP Red | 3500 @I _F =70mA | 35 |
| MVL-974TUYLEC | TS AlInGaP Amber | 3500 @I _F =70mA | 35 |
| MVL-974MTGC | InGaN True Green | 2000 @I _F =40mA | 35 |
| MVL-974MSGC | InGaN Signal Green | 1900 @I _F =40mA | 35 |
| MVL-974MBC | InGaN Blue | 1500 @I _F =40mA | 35 |
| MVL-974MW | White | 4000 @I _F =40mA | 35 |
| MVL-974HTGC | InGaN True Green | 1500 @I _F =20mA | 25 |
| MVL-974HSGC | InGaN Signal Green | 1200 @I _F =20mA | 25 |
| MVL-974HBC | InGaN Blue | 800 @I _F =20mA | 25 |
| MVL-974HW | White | 2000 @I _F =20mA | 35 |

Absolute Maximum Ratings at T_A=25°C

| Parameter | Device Type | | MVL-9X4UOLC MVL-9X4UYLC | MVL-9X4MTGC MVL-9X4MSGC MVL-9X4MBC MVL-9X4MW | MVL-9X4HTGC MVL-9X4HSGC MVL-9X4HBC MVL-9X4HW | Units |
|---|--|-------------------------------|----------------------------|---|---|-------|
| | MVL-9X4HUOLC MVL-9X4HUYLEC | MVL-9X4TUOLC MVL-9X4TUYLEC | | | | |
| 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 | 100°C for 30 seconds | | | | | |
| Preheat Temperature | 260°C for 5 seconds | | | | | |
| Solder Temperature | [1.5mm (0.06 in.) below seating plane] | | | | | |

Optical Characteristics at T_A=25°C

| Part Number | Total Flux f _v (mlm) | | Peak Wavelength l peak (nm) Typ. | Color, Dominant Wavelength l d (nm) Typ. | Viewing Angle 2q 1/2 (Degrees) Typ. |
|---------------|------------------------------------|-----------------------------|---|--|---|
| | Min. | Typ. | | | |
| MVL-974HUOLC | 600 @ I _F =70mA | 2500 @ I _F =70mA | 630 | 625 | 30 |
| MVL-974HUYLEC | 600 @ I _F =70mA | 2500 @ I _F =70mA | 592 | 590 | 30 |
| MVL-974TUOLC | 600 @ I _F =70mA | 3500 @ I _F =70mA | 640 | 630 | 35 |
| MVL-974TUYLEC | 600 @ I _F =70mA | 3500 @ I _F =70mA | 594 | 592 | 35 |
| MVL-974UOLC | 600 @ I _F =70mA | 1700 @ I _F =50mA | 630 | 625 | 30 |
| MVL-974UYLC | 600 @ I _F =70mA | 1700 @ I _F =50mA | 592 | 590 | 30 |
| MVL-974MTGC | 1000 @ I _F =40mA | 2000 @ I _F =40mA | 523 | 525 | 35 |
| MVL-974MSGC | 900 @ I _F =40mA | 1900 @ I _F =40mA | 502 | 505 | 35 |
| MVL-974MBC | 900 @ I _F =40mA | 1500 @ I _F =40mA | 468 | 470 | 35 |
| MVL-974HTGC | 200 @ I _F =20mA | 1500 @ I _F =20mA | 523 | 525 | 25 |
| MVL-974HSGC | 200 @ I _F =20mA | 1200 @ I _F =20mA | 502 | 505 | 25 |
| MVL-974HBC | 200 @ I _F =20mA | 800 @ I _F =20mA | 468 | 470 | 25 |

| Part Number | Total Flux f _v (mlm) | | Chromaticity Coordinates (Typ.) | |
|-------------|------------------------------------|-----------------------------|---------------------------------|------|
| | Min. | Typ. | X | Y |
| MVL-974MW | 600 @ I _F =40mA | 4000 @ I _F =40mA | 0.33 | 0.31 |
| MVL-974HW | 300 @ I _F =20mA | 2000 @ 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) Typ. | Thermal Resistance R _{θJ-A} (°C/W) Typ. |
|------------------|--|------------------------|------|--|------|---|---|
| | Min. | Typ. | Max | Min. | Typ. | | |
| MVL-9X4HUOLC | 1.83 | 2.2 | 2.79 | 10 | 20 | 120 | 250 |
| MVL-9X4HUYLEC | | @ I _F =70mA | | | | | |
| MVL-9X4UOLC | 1.83 | 2.15 | 2.79 | 10 | 20 | 120 | 250 |
| MVL-9X4UYLC | | @ I _F =50mA | | | | | |
| MVL-9X4TUOLC | 2.07 | 2.5 | 3.15 | 10 | 20 | 125 | 250 |
| MVL-9X4TUYLEC | | @ I _F =70mA | | | | | |
| MVL-9X4(U)TGC | 3 | 3.7 | 5.2 | | | | |
| MVL-9X4(M)(U)SGC | | @ I _F =40mA | | 5 | 10 | 90 | 180 |
| MVL-9X4(M)(U)BC | | | | | | | |
| MVL-9X4(M)(U)W | | | | | | | |
| MVL-9X4HTGC | 3 | 3.7 | 4.0 | | | | |
| MVL-9X4HSGC | | @ I _F =20mA | | 5 | 10 | 90 | 180 |
| MVL-9X4HBC | | | | | | | |
| MVL-9X4HW | | | | | | | |

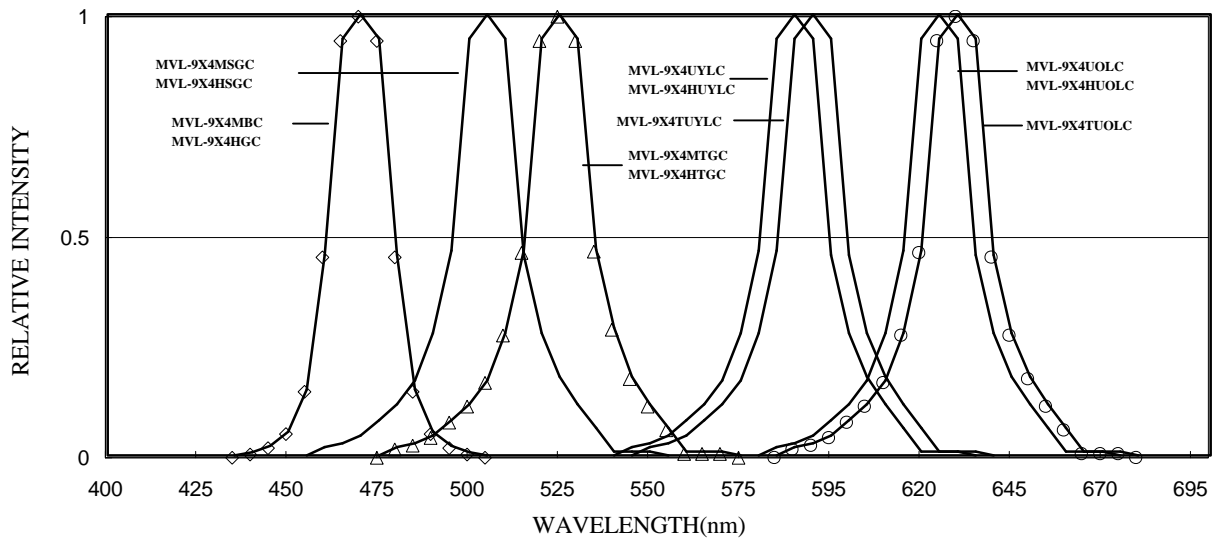


Figure 1. Relative Intensity vs. Wavelength.

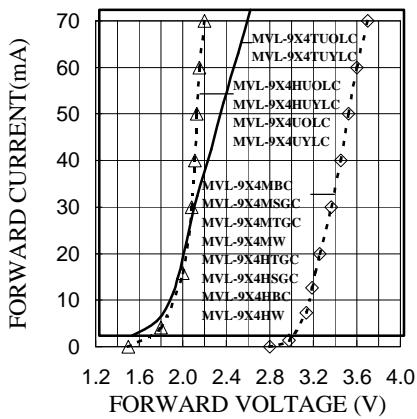


Figure 2. Forward Current vs. Forward Voltage.

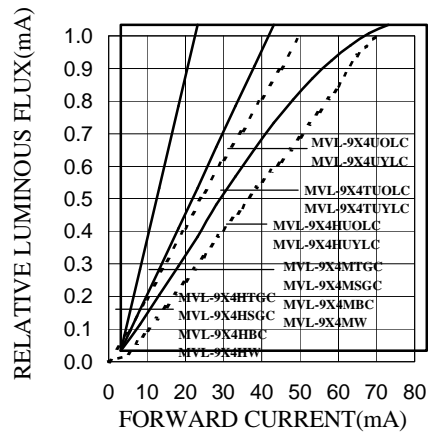


Figure 3. Relative Luminous Flux vs. Forward Current.

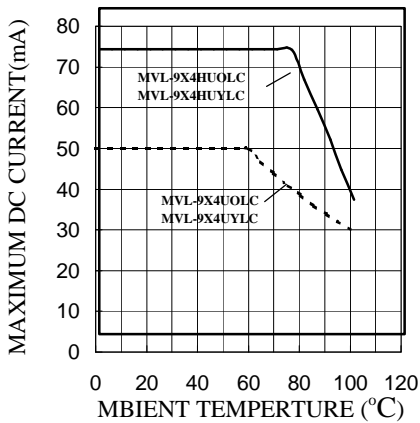


Figure 4a. Maximum DC Forward Current vs. Ambient Temperature.

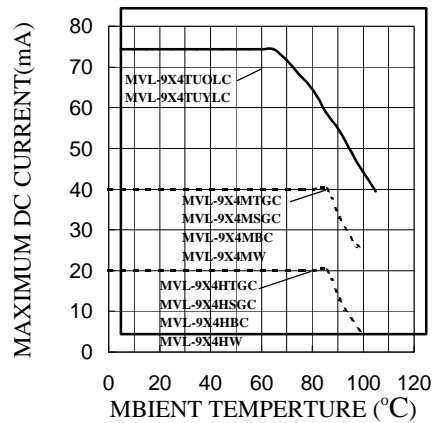


Figure 4b. Maximum DC Forward Current vs. Ambient Temperature.

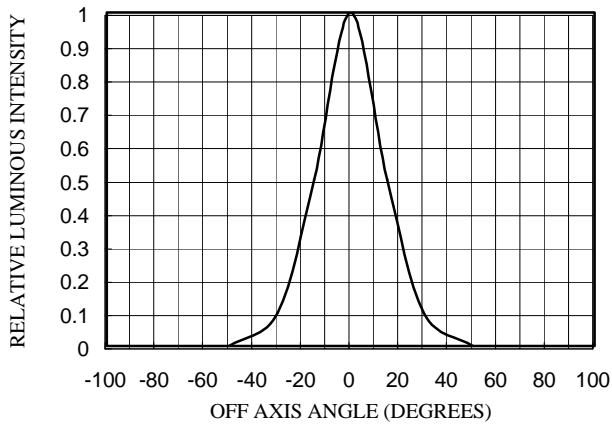


Figure 5. MVL-974HUOLC/MVL-974HUYLC/
MVL-974UOLC/MVL-974UYLC
Relative Luminous Intensity vs. Off Axis Angle.

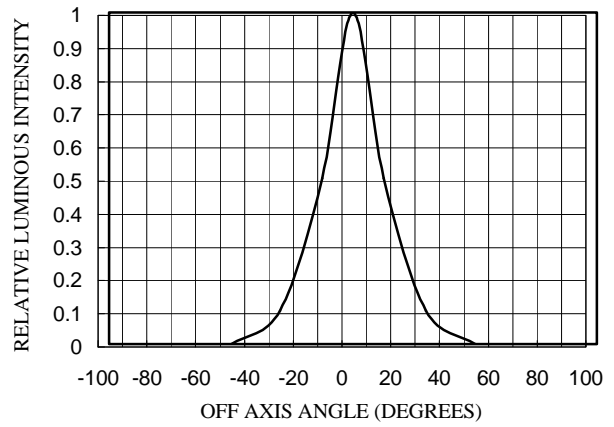


Figure 6. MVL-974HTGC/MVL-974HSGC/MVL-974HBC
Relative Luminous Intensity vs. Off Axis Angle.

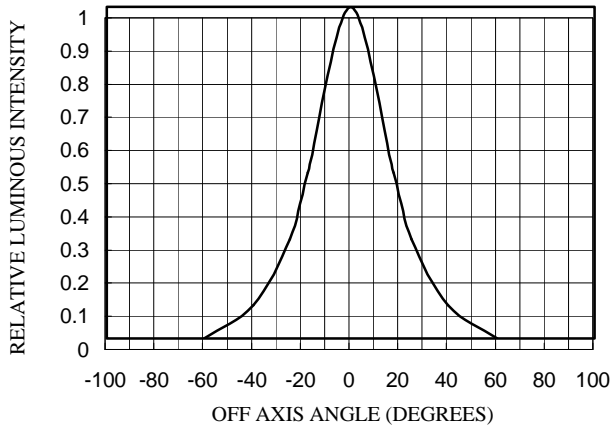


Figure 7. MVL-974TUOLC/MVL-974TUYLC/MVL-974MTGC
MVL-974MSGC/MVL-974MBC/MVL-974MW/MVL-974HW
Relative Luminous Intensity vs. Off Axis Angle.

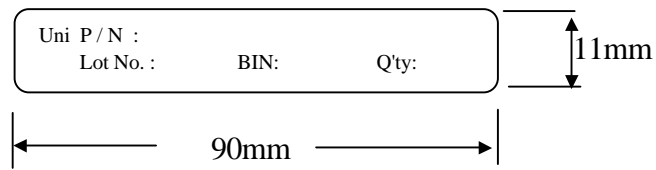
Packaging

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.



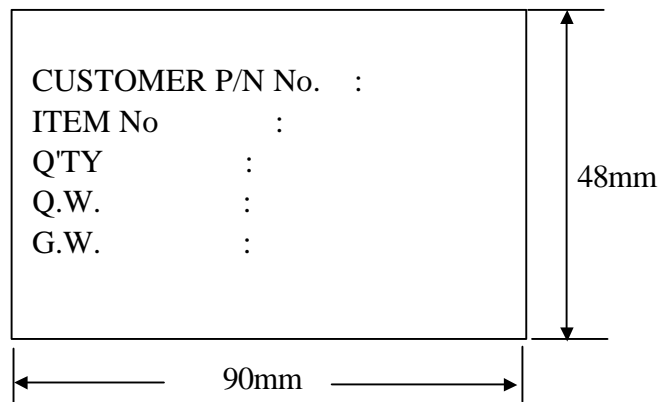
Boxes of LEDs

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 JACK LED Bin Codes

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

| Luminous Flux (Light-output in lumens) | | | | |
|--|------------|------------|------------|------------|
| BIN CODE | Minimum | | Maximum | |
| | A | 0.6 | 1.2 | 0.1 |
| 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 | 5.45 | | |
| I | 4.5 | 6.1 | | |
| J | 5.0 | 6.7 | | |
| K | 5.5 | 7.3 | | |

| Dominant Wavelength (in nanometers) @ I _F =20mA | | | | | | | | | | |
|--|-----------------------|------------|-----------------------|------------|--------------|------------|--------------|------------|------------|------------|
| BIN CODE | TUOLC , HUOLC UOLC | | TUYLC , HUYLC UYLC | | MTGC HTGC | | MSGC HSGC | | MBC HBC | |
| | 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) | | | | |
|-------------------------|-------------|-------------|------------|------------|
| BIN CODE | Minimum | | Maximum | |
| | 0 | 1.83 | 2.07 | 3.0 |
| 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-9X4MW @I _F =40mA MVL-9X4HW @IF=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 | 5.45 |
| I | 4.5 | 6.1 |
| J | 5.0 | 6.7 |
| K | 5.5 | 7.3 |
| L | 6.0 | 7.9 |
| M | 6.5 | 8.5 |
| N | 7.0 | 9.1 |
| O | 7.5 | 9.7 |

| Chromaticity Coordinates @I _F =20mA | | | | | | | | |
|--|-------|-------|-------|-------|-------|-------|-------|-------|
| BIN CODE | 1 | | 2 | | 3 | | 4 | |
| | X | Y | X | Y | X | Y | X | Y |
| A | 0.264 | 0.317 | 0.273 | 0.336 | 0.273 | 0.286 | 0.264 | 0.267 |
| B | 0.273 | 0.336 | 0.283 | 0.353 | 0.283 | 0.305 | 0.273 | 0.286 |
| C | 0.264 | 0.267 | 0.273 | 0.286 | 0.288 | 0.262 | 0.280 | 0.248 |
| D | 0.273 | 0.286 | 0.283 | 0.305 | 0.296 | 0.276 | 0.288 | 0.262 |
| E | 0.283 | 0.345 | 0.306 | 0.372 | 0.306 | 0.352 | 0.283 | 0.325 |
| F | 0.306 | 0.372 | 0.330 | 0.400 | 0.330 | 0.380 | 0.306 | 0.352 |
| G | 0.285 | 0.325 | 0.306 | 0.352 | 0.306 | 0.332 | 0.283 | 0.305 |
| H | 0.306 | 0.352 | 0.330 | 0.380 | 0.330 | 0.360 | 0.306 | 0.332 |
| I | 0.283 | 0.305 | 0.306 | 0.332 | 0.308 | 0.317 | 0.287 | 0.295 |
| J | 0.306 | 0.332 | 0.330 | 0.360 | 0.330 | 0.339 | 0.308 | 0.317 |
| K | 0.287 | 0.295 | 0.308 | 0.317 | 0.313 | 0.297 | 0.296 | 0.276 |
| L | 0.308 | 0.317 | 0.330 | 0.339 | 0.330 | 0.318 | 0.313 | 0.297 |
| M | 0.296 | 0.276 | 0.313 | 0.297 | 0.313 | 0.277 | 0.296 | 0.256 |
| N | 0.313 | 0.297 | 0.330 | 0.318 | 0.330 | 0.298 | 0.313 | 0.277 |
| O | 0.330 | 0.390 | 0.345 | 0.402 | 0.345 | 0.372 | 0.330 | 0.360 |
| P | 0.345 | 0.402 | 0.361 | 0.415 | 0.361 | 0.385 | 0.345 | 0.372 |
| Q | 0.330 | 0.360 | 0.345 | 0.372 | 0.345 | 0.334 | 0.330 | 0.318 |
| R | 0.345 | 0.372 | 0.361 | 0.385 | 0.361 | 0.351 | 0.345 | 0.334 |

Tolerance : ± 0.01

| Forward Voltage (Volts) | | |
|--|------------|------------|
| MVL-9X4MW @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 |