

MVL-924HUOLC  
MVL-924UOLC  
MVL-924HUYLC  
MVL-924UYLC  
MVL-924TUOLC  
MVL-924TUYLC  
MVL-924MTGC / 924HTGC  
MVL-924MSGC / 924HSGC  
MVL-924MBC / 924HBC  
MVL-924MW / 924HW

# Technical Data

## JACK LEDs

11/19/2003

### Benefits

- Fewer LEDs Required
- Lowers Lighting System Cost

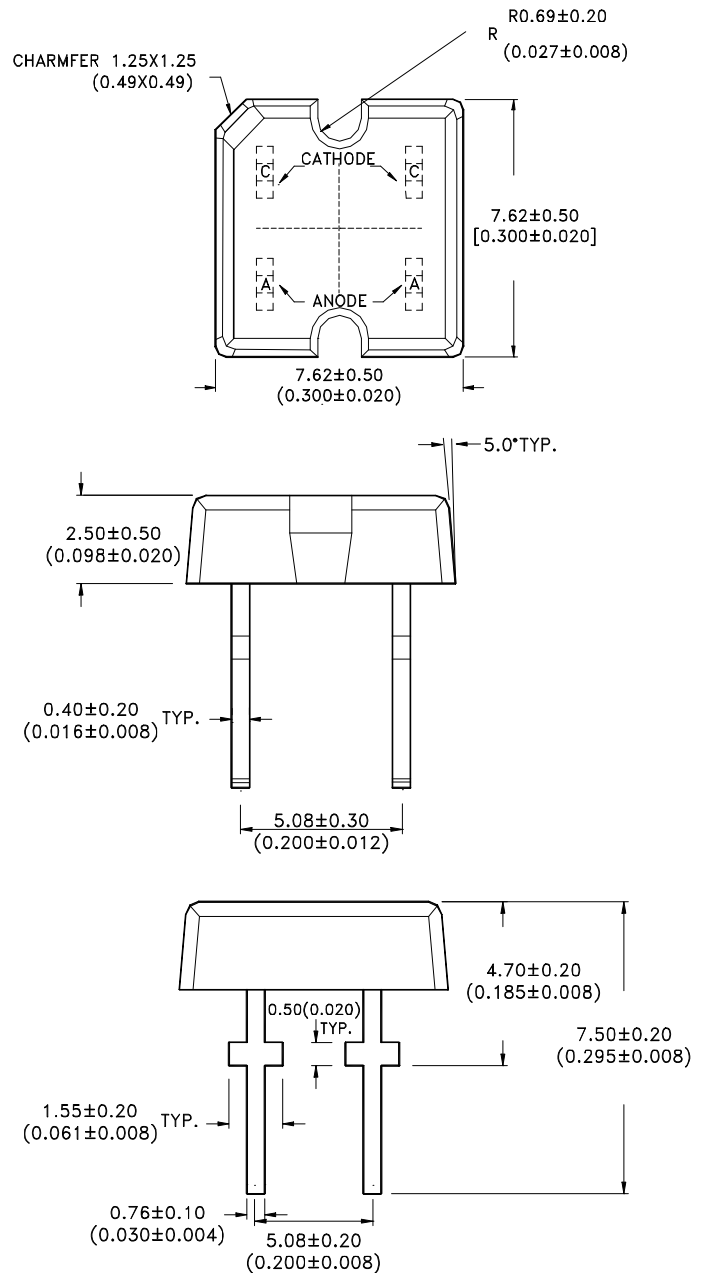
### Features

- 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-924HUOLC	AS AlInGaP Red-Orange	1700 @IF=70mA	115
MVL-924UOLC		1100 @IF=50mA	110
MVL-924HUYLC	AS AlInGaP Amber	1700 @IF=70mA	115
MVL-924UYLC		1100 @IF=50mA	105
MVL-924TUOLC	TS AlInGaP Red	2500 @IF=70mA	115
MVL-924TUYLC	TS AlInGaP Amber	2500 @IF=70mA	115
MVL-924MTGC	InGaN True Green	1400 @IF=40mA	100
MVL-924MSGC	InGaN Signal Green	1300 @IF=40mA	100
MVL-924MBC	InGaN Blue	1200 @IF=40mA	90
MVL-924MW	White	2000 @IF=40mA	120
MVL-924HTGC	InGaN True Green	500 @IF=20mA	100
MVL-924HSGC	InGaN Signal Green	400 @IF=20mA	100
MVL-924HBC	InGaN Blue	500 @IF=20mA	90
MVL-924HW	White	1500 @IF=20mA	100

## Absolute Maximum Ratings at T<sub>A</sub>=25°C

Device Type  Parameter	MVL-924HUOLC MVL-924HUYLC	MVL-924TUOLC MVL-924TUYLC	MVL-924UOLC MVL-924UYLC	MVL-924MTGC MVL-924MSGC MVL-924MBC MVL-924MW	MVL-924HBC MVL-924HTGC MVL-924HSGC MVL-924HW	Units
	DC Forward Current	70	70	50	40	
Power Dissipation	150	182	120	140	74	mW
Reverse Voltage (I <sub>R</sub> =100mA)	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	260°C for 5 seconds					
	[ 1.5mm ( 0.06 in. ) below seating plane ]					

### Optical Characteristics at T<sub>A</sub> = 25°C

Part Number	Total Flux f <sub>v</sub> (mlm)		Peak Wavelength λ peak (nm) Typ.	Color, Dominant Wavelength λ d (nm) Typ.	Viewing Angle 2q 1/2 (Degrees) Typ.
	Min.	Typ.			
MVL-924HUOLC	600 @ I <sub>F</sub> =70mA	1700 @ I <sub>F</sub> =70mA	630	625	115
MVL-924HUYLEC	600 @ I <sub>F</sub> =70mA	1700 @ I <sub>F</sub> =70mA	592	590	115
MVL-924TUOLC	600 @ I <sub>F</sub> =70mA	2500 @ I <sub>F</sub> =70mA	640	630	115
MVL-924TUYLEC	600 @ I <sub>F</sub> =70mA	2500 @ I <sub>F</sub> =70mA	594	592	115
MVL-924UOLC	600 @ I <sub>F</sub> =50mA	1100 @ I <sub>F</sub> =50mA	630	625	110
MVL-924UYLEC	600 @ I <sub>F</sub> =50mA	1100 @ I <sub>F</sub> =50mA	592	590	105
MVL-924MTGC	100 @ I <sub>F</sub> =40mA	1400 @ I <sub>F</sub> =40mA	523	525	100
MVL-924MSGC	100 @ I <sub>F</sub> =40mA	1300 @ I <sub>F</sub> =40mA	502	505	100
MVL-924MBC	100 @ I <sub>F</sub> =40mA	1200 @ I <sub>F</sub> =40mA	468	470	90
MVL-924HTGC	100 @ I <sub>F</sub> =20mA	500 @ I <sub>F</sub> =20mA	523	525	100
MVL-924HSGC	100 @ I <sub>F</sub> =20mA	400 @ I <sub>F</sub> =20mA	502	505	100
MVL-924HBC	100 @ I <sub>F</sub> =20mA	500 @ I <sub>F</sub> =20mA	468	470	90

Part Number	Total Flux f <sub>v</sub> (mlm)		Chromaticity Coordinates (Typ.)	
	Min.	Typ.	X	Y
MVL-924MW	600 @ I <sub>F</sub> =40mA	2000 @ I <sub>F</sub> =40mA	0.33	0.31
MVL-924HW	600 @ I <sub>F</sub> =20mA	1500 @ I <sub>F</sub> =20mA	0.33	0.31

### Electrical Characteristics at T<sub>A</sub>=25°C

Device Type	Forward Voltage V <sub>F</sub> (Volts)			Reverse Breakdown V <sub>R</sub> (Volts) @ I <sub>R</sub> =100mA		Thermal Resistance R <sub>qJ-PIN</sub> (°C/W) Typ.	Thermal Resistance R <sub>qJ-A</sub> (°C/W) Typ.
	Min.	Typ.	Max	Min.	Typ.		
MVL-924HUOLC MVL-924HUYLEC	1.83	2.2 @ I <sub>F</sub> =70mA	2.79	10	20	120	250
MVL-924UOLC MVL-924UYLEC	1.83	2.15 @ I <sub>F</sub> =50mA	2.79	10	20	120	250
MVL-924TUOLC MVL-924TUYLEC	2.07	2.5 @ I <sub>F</sub> =70mA	3.15	10	20	125	250
MVL-924MTGC MVL-924MSGC MVL-924MBC MVL-924MW	3	3.7 @ I <sub>F</sub> =40mA	5.2	5	10	90	180
MVL-924HTGC MVL-924HSGC MVL-924HBC MVL-924HW	3	3.7 @ I <sub>F</sub> =20mA	4	5	10	90	180

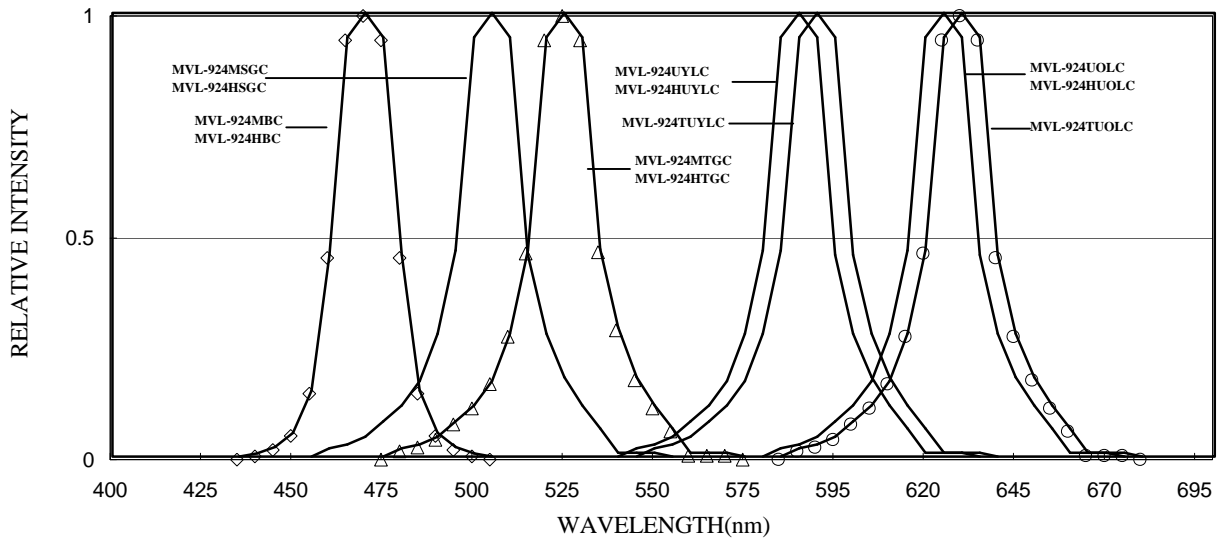


Figure 1. Relative Intensity vs. Wavelength.

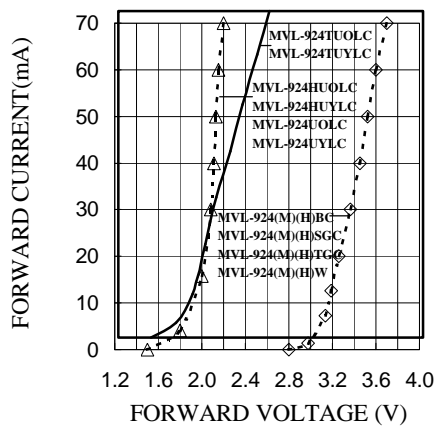


Figure 2. Forward Current vs. Forward Voltage.

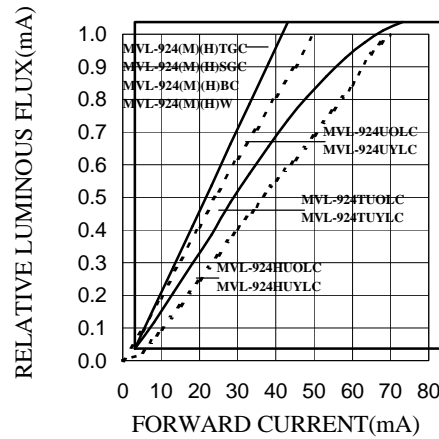


Figure 3. Relative Luminous Flux vs. Forward Current.

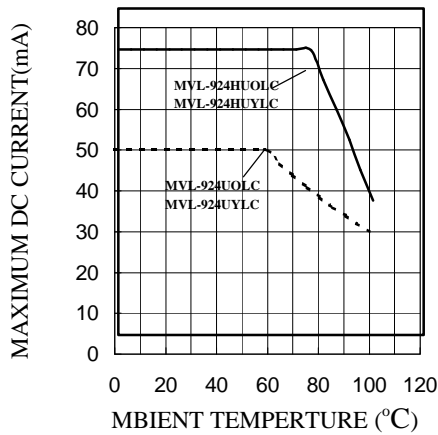


Figure 4a. Maximum DC Forward Current vs. Ambient Temperature.

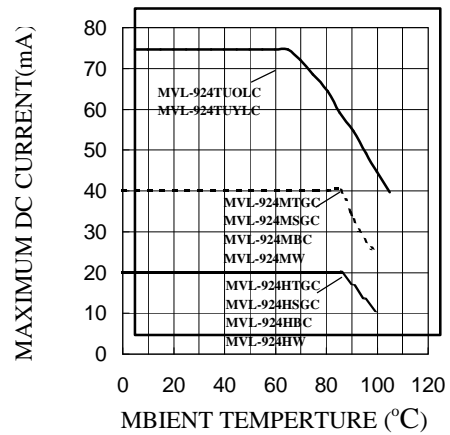


Figure 4b. Maximum DC Forward Current vs. Ambient Temperature.

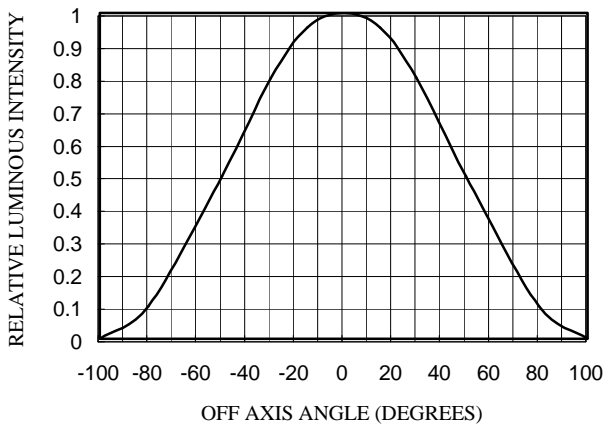


Figure 5. MVL-924MTGC/MVL-924HTGC/  
MVL-924MSGC/MVL-924HSGC  
Relative Luminous Intensity vs. Off Axis Angle.

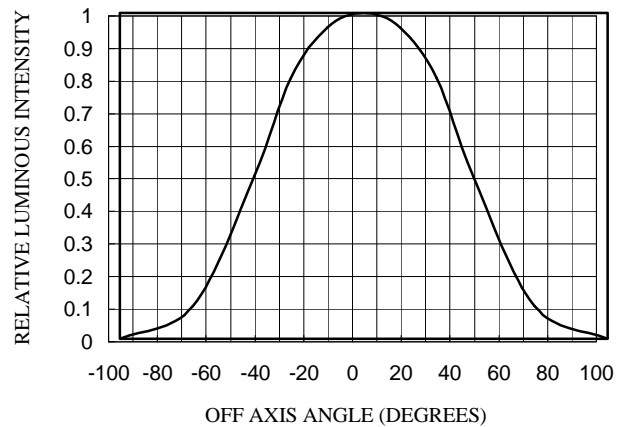


Figure 6. MVL-924MBC/MVL-924HBC  
Relative Luminous Intensity vs. Off Axis Angle.

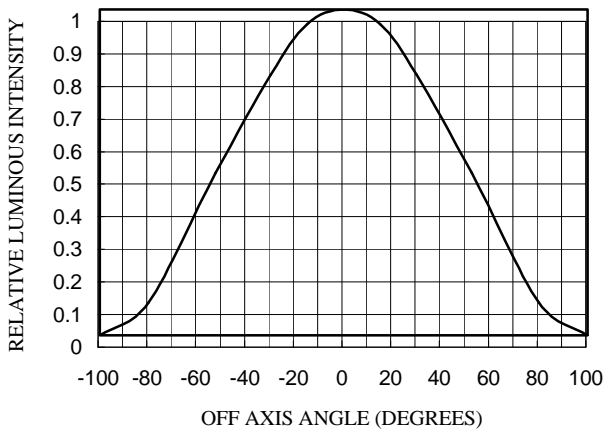


Figure 7. MVL-924UYLC  
Relative Luminous Intensity vs. Off Axis Angle.

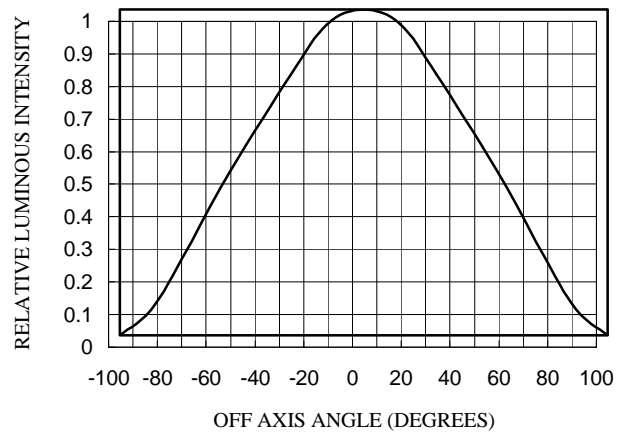


Figure 8. MVL-924UOLC  
Relative Luminous Intensity vs. Off Axis Angle.

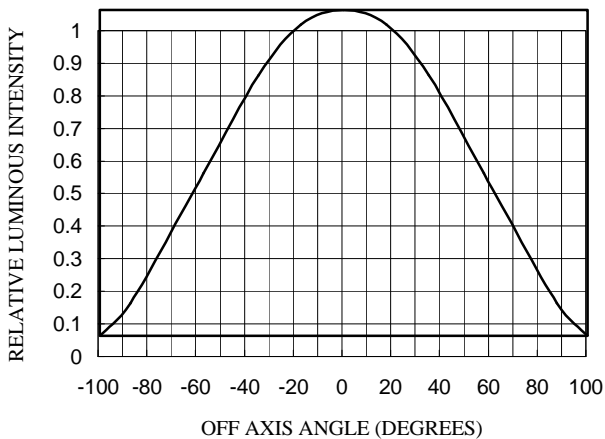


Figure 9. MVL-924HUOLC/MVL-924HUYLC/  
MVL-924TUOLC/MVL-924TUYLC/MVL-924TGC  
Relative Luminous Intensity vs. Off Axis Angle.

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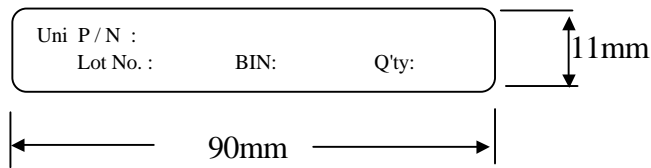
## Packaging

### 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.



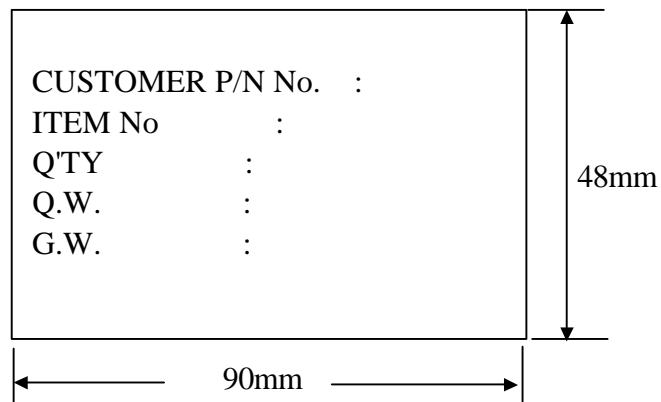
### Boxes of LEDs

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		
<b>C</b>	<b>2</b>	<b>3</b>

Luminous Flux (Light-output in lumens)				
BIN CODE	Minimum		Maximum	
A	0.6	1.2	0.1	0.9
B	1.0	1.8	0.5	1.4
<b>C</b>	<b>1.5</b>	<b>2.4</b>	<b>1.0</b>	<b>1.9</b>
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 <sub>F</sub> =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
<b>2</b>	<b>614</b>	<b>622</b>	<b>587</b>	<b>593</b>	<b>524</b>	<b>535</b>	<b>500</b>	<b>509</b>	<b>467</b>	<b>475</b>
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	3.4
1	1.95	2.19	3.2	3.6
2	2.07	2.31	3.4	3.8
<b>3</b>	<b>2.19</b>	<b>2.43</b>	<b>3.6</b>	<b>4.0</b>
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

<b>Category Code</b>		
<b>C</b>	<b>A</b>	<b>3</b>

Luminous Flux (Light-output in lumens)		
	MVL-9X4MW @I <sub>F</sub> =40mA MVL-9X4HW @I <sub>F</sub> =20mA	
BIN CODE	Minimum	Maximum
A	0.6	1.2
B	1.0	1.8
<b>C</b>	<b>1.5</b>	<b>2.4</b>
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 <sub>F</sub> =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 <sub>F</sub> =40mA MVL-9X4HW @I <sub>F</sub> =20mA	
BIN CODE	Minimum	Maximum
0	3.0	3.4
1	3.2	3.6
2	3.4	3.8
<b>3</b>	<b>3.6</b>	<b>4.0</b>
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