Unity Opto Technology Co., Ltd.

MVL-924HUOL
MVL-924UOLC
MVL-924HUYLC
MVL-924UYLC
MVL-924TUOLC
MVL-924TUYLC
MVL-924TGC
MVL-924SGC
MVL-924BC
MVL-924W/MVL-924UW

Technical Data
JACK LEDs

02/25/2002

Benefits

- Fewer LEDs Required
- Lowers Lighting System Cost

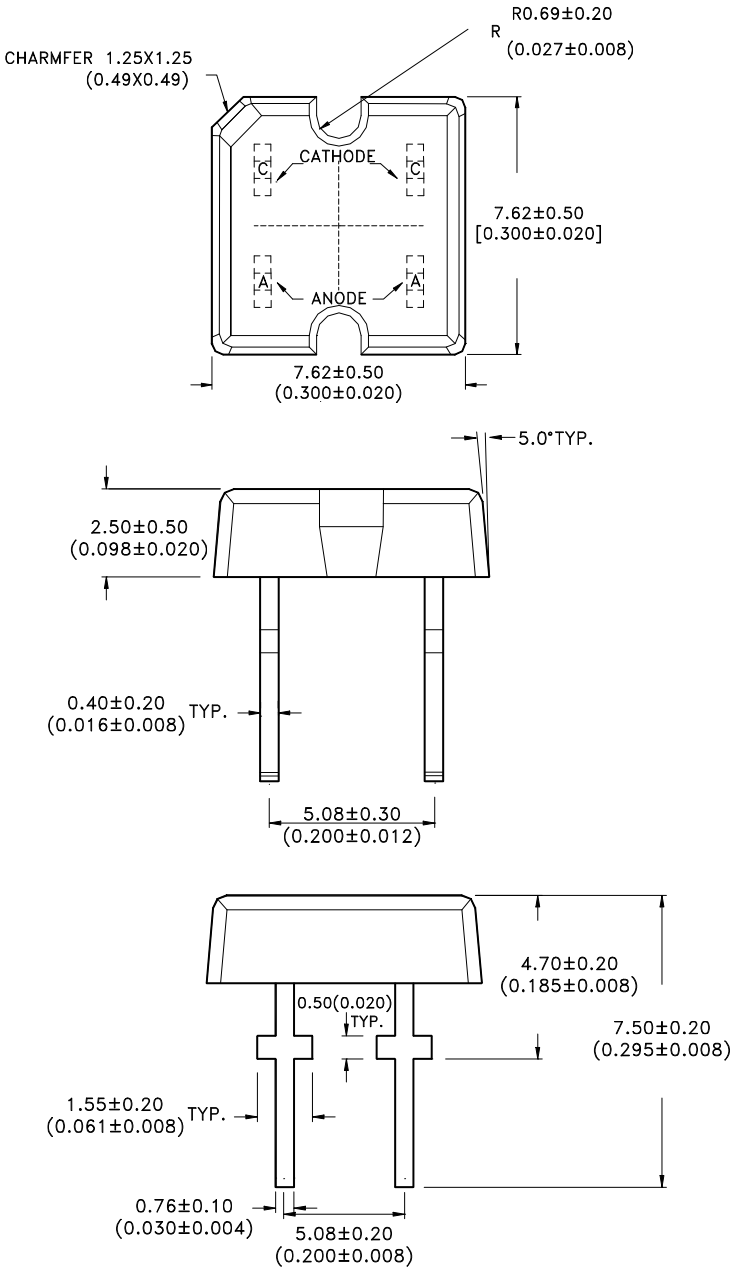
Features

- 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 @I_F=70mA	120
MVL-924UOLC		1100 @I_F=50mA	120
MVL-924HUYLC	AS AlInGaP Amber	1700 @I_F=70mA	120
MVL-924UYLC		1100 @I_F=50mA	120
MVL-924TUOLC	TS AlInGaP Red	2500 @I_F=70mA	140
MVL-924TUYLC	TS AlInGaP Amber	2500 @I_F=70mA	140
MVL-924TGC	InGaN True Green	700 @I_F=40mA	140
MVL-924SGC	InGaN Signal Green	600 @I_F=40mA	140
MVL-924BC	InGaN Blue	500 @I_F=40mA	140
MVL-924W / MVL-924UW	White	1000 / 1500 @I_F=40mA	140

Absolute Maximum Ratings at T_A=25°C

Parameter \ Device Type	MVL-924HUOLC MVL-924HUYLC	MVL-924TUOLC MVL-924TUYLC	MVL-924UOLC MVL-924UYLC	MVL-924TGC MVL-924SGC MVL-924BC MVL-924(U)W	Units
DC Forward Current	70	70	50	40	mA
Power Dissipation	150	182	120	140	mW
Reverse Voltage (I_R=100μA)	10	10	10	5	V
LED Junction Temperature	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 (mlm) Min.	Total Flux f_v (mlm) Typ.	Peak Wavelength λpeak (nm) Typ.	Color, Dominant Wavelength λd (nm) Typ.	Viewing Angle 2θ 1/2 (Degrees) Typ.
MVL-924HUOLC	600 @IF=70mA	1700 @I_F=70mA	630	625	120
MVL-924HUYLC	600 @IF=70mA	1700 @I_F=70mA	592	590	120
MVL-924TUOLC	600 @IF=70mA	2500 @I_F=70mA	640	630	140
MVL-924TUYLC	600 @IF=70mA	2500 @I_F=70mA	594	592	140
MVL-924UOLC	600 @I_F=50mA	1100 @I_F=50mA	630	625	120
MVL-924UYLC	600 @I_F=50mA	1100 @I_F=50mA	592	590	120
MVL-924TGC	100 @IF=40mA	700 @I_F=40mA	523	525	140
MVL-924SGC	100 @IF=40mA	600 @I_F=40mA	502	505	140
MVL-924BC	100 @IF=40mA	500 @I_F=40mA	468	470	140

Part Number	Total Flux f_v (mlm) Min.	Total Flux f_v (mlm) Typ.	Chromaticity Coordinates (Typ.) X	Chromaticity Coordinates (Typ.) Y
MVL-924W/MVL-924UW	600 @I_F=40mA	1000 / 1500 @I_F=40mA	**0.33**	**0.31**

Electrical Characteristics at T_A=25°C

Device Type	Forward Voltage V_F (Volts) Min.	Typ.	Max	Reverse Breakdown V_R (Volts) @I_R=100μA Min.	Typ.	Thermal Resistance $R_{\theta J\text{-}PIN}$ (°C/W) Typ.	Thermal Resistance $R_{\theta J\text{-}A}$(°C/W) Typ.
MVL-924HUOLC MVL-924HUYLC	1.83	2.2 @I_F=70mA	2.79	10	20	120	250
MVL-924UOLC MVL-924UYLC	1.83	2.15 @I_F=50mA	2.79	10	20	120	250
MVL-924TUOLC MVL-924TUYLC	2.07	2.5 @I_F=70mA	3.15	10	20	125	250
MVL-924TGC MVL-924SGC MVL-924BC MVL-924(U)W	3	3.7 @I_F=40mA	5.2	5	10	90	180

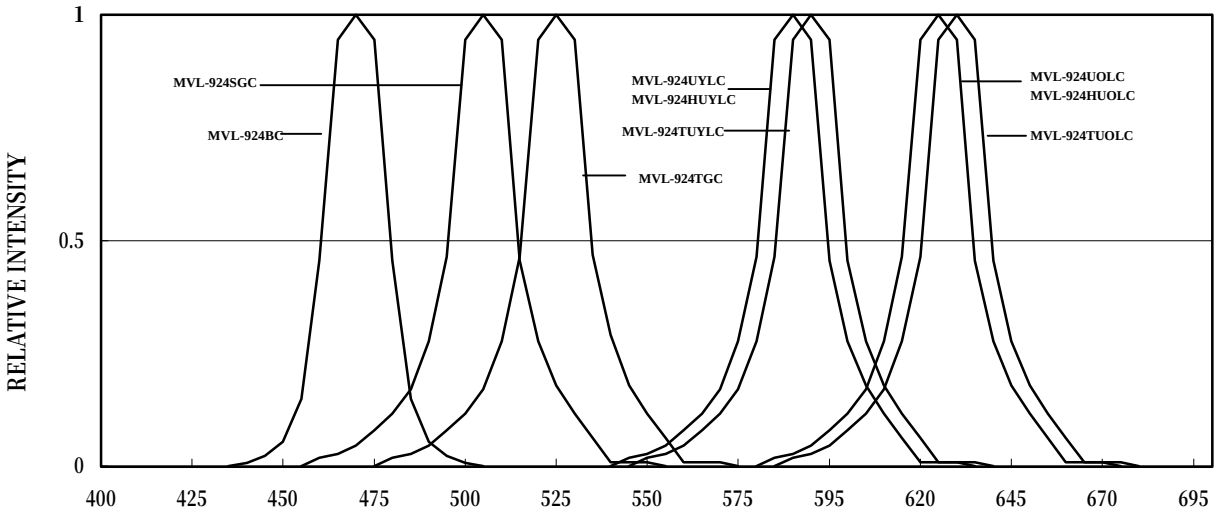


Figure 1.Relative Intensity vs.Wavelength.

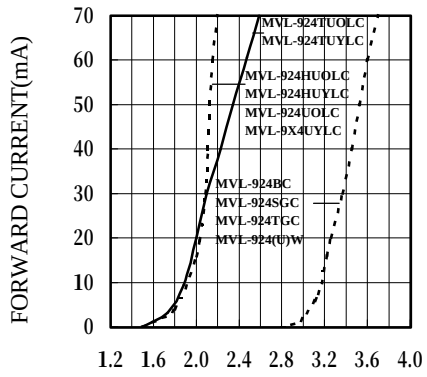


Figure 2.Forward Current vs. Forwaard Voltage.

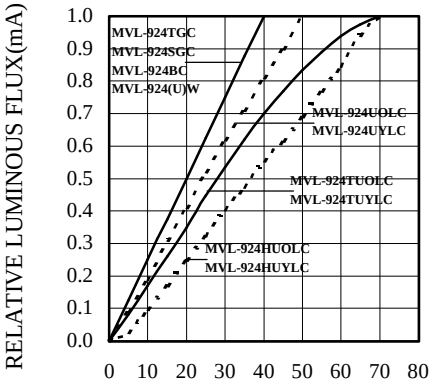


Figure 3. RelativeLuminous Flux vs. Forward Current.

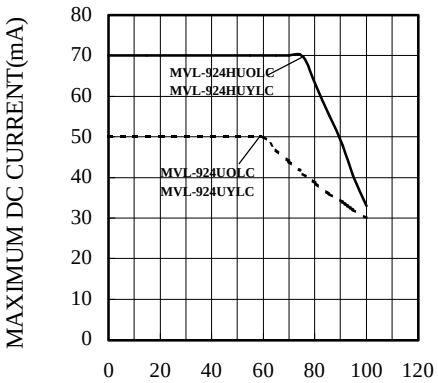


Figure 4a. Maximum DC Forward Current vs. Ambient Temperature.

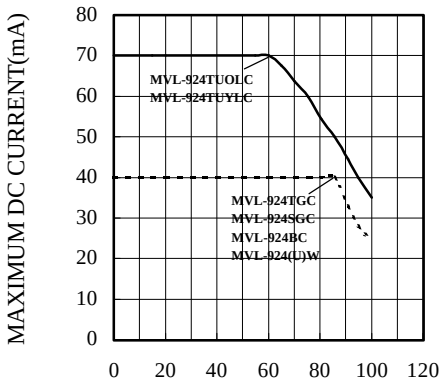


Figure 4b. Maximum DC Forward Current vs. Ambient Temperature.

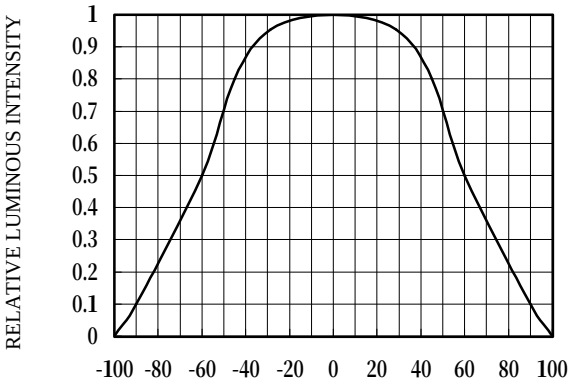


Figure 5. MVL-924HUOLC、MVL-924HUYLC、
MVL-924UOLC、MVL-924UYLC
Relative Luminous Intensity vs. Off Axis Angle.

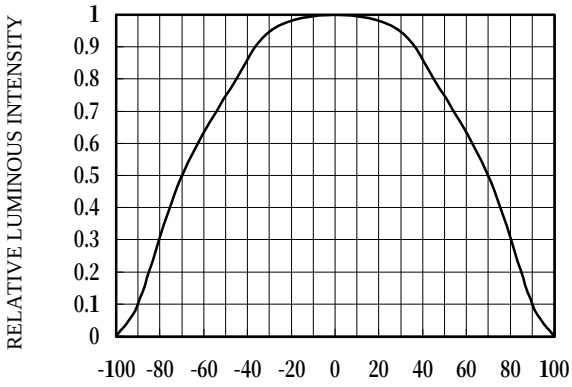
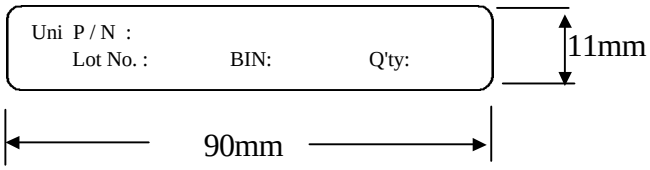


Figure 6. MVL-924TUOLC、MVL-924TUYLC、MVL-924(U)W
MVL-924TGC、MVL-924SGC、MVL-924BC、
Relative Luminous Intensity vs. Off Axis Angle.

Packaging

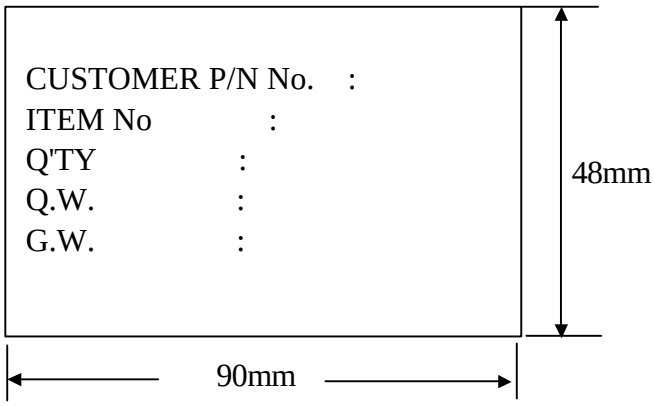
Tubes of LEDs

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 -output in lumens)

	MVL-9X4HUOL MVL-9X4HUYL MVL-9X4TUOL MVL-9X4TUYL @I_F=70mA MVL-9X4UOL MVL-9X4UYL@I_F=50mA		MVL-9X4TG MVL-9X4SG MVL-9X4B @ I_F=40mA	
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		
F	3.0	4.2		
G	3.5	4.8		
H	4.0	6.1		

Dominant Wavelength (in nanometers) @ I_F=20mA

	TUOL, HUOL, UOL		TUYL, HUYL, UYL		TG		SG		B	
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-9X4HUOL MVL-9X4HUYL MVL-9X4TUOL MVL-9X4TUYL @I_F=70mA MVL-9X4UOL MVL-9X4UYL@I_F=50mA		MVL-9X4TG MVL-9X4SG MVL-9X4B @ I_F=40mA	
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	
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	.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	
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