

MVL-984HUOLC
MVL-984UOLC
MVL-984HUYLC
MVL-984UYLC
MVL-984TUOLC
MVL-984TUYLC
MVL-984MTGC
MVL-984MSGC
MVL-984MBC
MVL-984MW
MVL-984HW
MVL-984HTGC
MVL-984HSGC
MVL-984HBC

Technical Data JACK LEDs

11/19/2003

Benefits

- Fewer LEDs Required
- Lowers Lighting System Cost

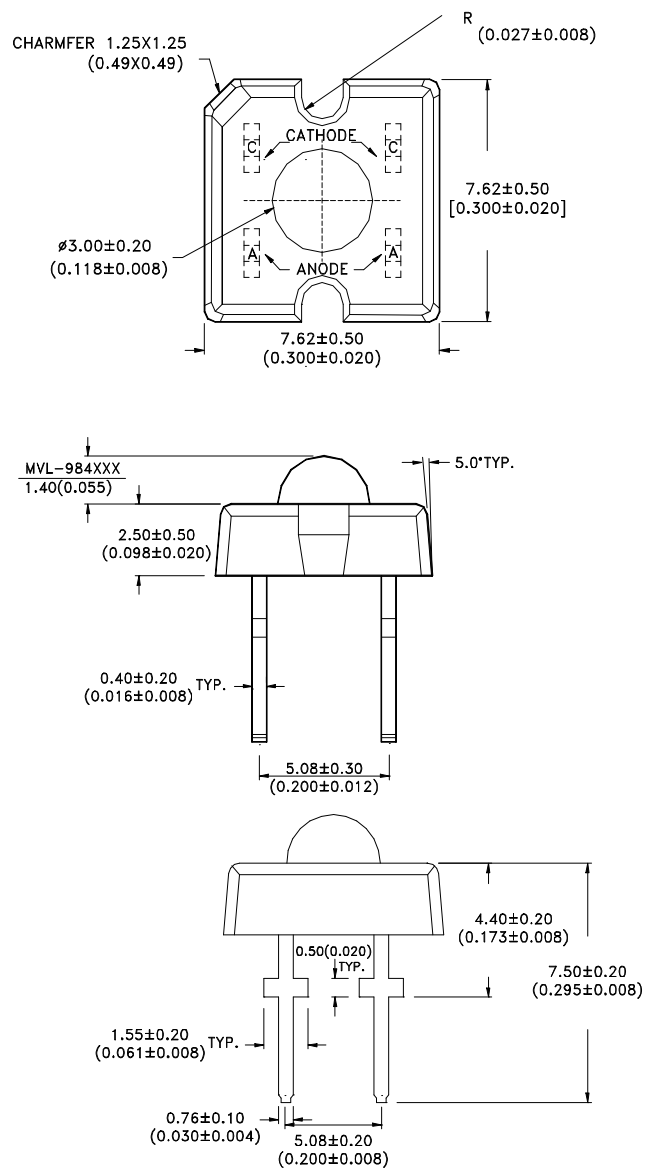
Features

- 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-984HUOLC	AS AlInGaP Red-Orange	2500 @I _F =70mA	80
MVL-984UOLC		1700 @I _F =50mA	80
MVL-984HUYLEC	AS AlInGaP Amber	2500 @I _F =70mA	80
MVL-984UYLC		1700 @I _F =50mA	80
MVL-984TUOLC	TS AlInGaP Red	3500 @I _F =70mA	100
MVL-984TUYLC	TS AlInGaP Amber	3500 @I _F =70mA	100
MVL-984MTGC	InGaN True Green	2000 @I _F =40mA	80
MVL-984MSGC	InGaN Signal Green	1900 @I _F =40mA	90
MVL-984MBC	InGaN Blue	1500 @I _F =40mA	90
MVL-984MW	White	4000 @I _F =40mA	70
MVL-984HW	White	2000 @I _F =20mA	70
MVL-984HTGC	InGaN True Green	1500 @I _F =20mA	80
MVL-984HSGC	InGaN Signal Green	1200 @I _F =20mA	80
MVL-984HBC	InGaN Blue	800 @I _F =20mA	80

Absolute Maximum Ratings at T_A=25°C

Parameter	Device Type						Units
	MVL-9X4HUOLC MVL-9X4HUYLEC	MVL-9X4TUOLC MVL-9X4TUYLC	MVL-9X4UOLC MVL-9X4UYLC	MVL-9X4MTGC MVL-9X4MSGC MVL-9X4MBC MVL-9X4MW	MVL-9X4HTGC MVL-9X4HSGC MVL-9X4HBC MVL-9X4HW		
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 (mlm)		Peak Wavelength l peak (nm) Typ.	Color, Dominant Wavelength l d (nm) Typ.	Viewing Angle 2q 1/2 (Degrees) Typ.
	Min.	Typ.			
MVL-984HUOLC	600 @ I _F =70mA	2500 @ I _F =70mA	630	625	80
MVL-984HUYLEC	600 @ I _F =70mA	2500 @ I _F =70mA	592	590	80
MVL-984TUOLC	600 @ I _F =70mA	3500 @ I _F =70mA	640	630	100
MVL-984TUYLEC	600 @ I _F =70mA	3500 @ I _F =70mA	594	592	100
MVL-984UOLC	600 @ I _F =70mA	1700 @ I _F =50mA	630	625	80
MVL-984UYLC	600 @ I _F =70mA	1700 @ I _F =50mA	592	590	80
MVL-984MTGC	1000 @ I _F =40mA	2000 @ I _F =40mA	523	525	80
MVL-984MSGC	900 @ I _F =40mA	1900 @ I _F =40mA	502	505	90
MVL-984MBC	900 @ I _F =40mA	1500 @ I _F =40mA	468	470	90
MVL-984HTGC	200 @ I _F =20mA	1500 @ I _F =20mA	523	525	80
MVL-984HSGC	200 @ I _F =20mA	1200 @ I _F =20mA	502	505	80
MVL-984HBC	200 @ I _F =20mA	800 @ I _F =20mA	468	470	80

Part Number	Total Flux f _v (mlm)		Chromaticity Coordinates (Typ.)	
	Min.	Typ.	X	Y
MVL-984MW	600 @ I _F =40mA	4000 @ I _F =40mA	0.33	0.31
MVL-984HW	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-9X4MTGC	3	3.7	5.2				
MVL-9X4MSGC		@ I _F =40mA		5	10	90	180
MVL-9X4MBC							
MVL-9X4MW							
MVL-9X4HTGC	3	3.7	4.0				
MVL-9X4HSGC		@ I _F =20mA		5	10	90	180
MVL-9X4HBC							
MVL-9X4HW							

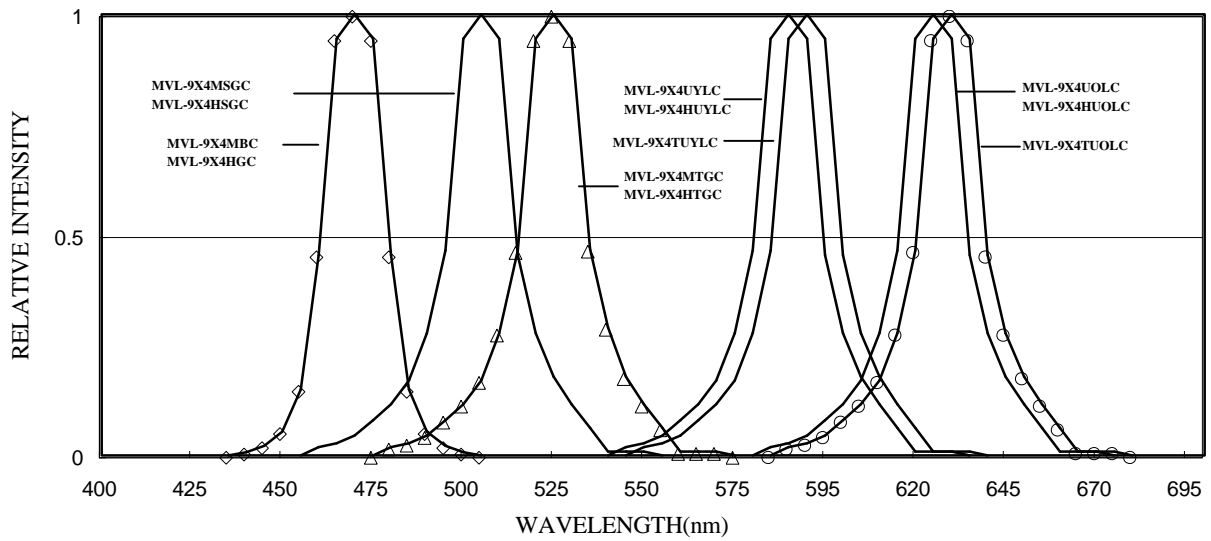


Figure 1. Relative Intensity vs. Wavelength.

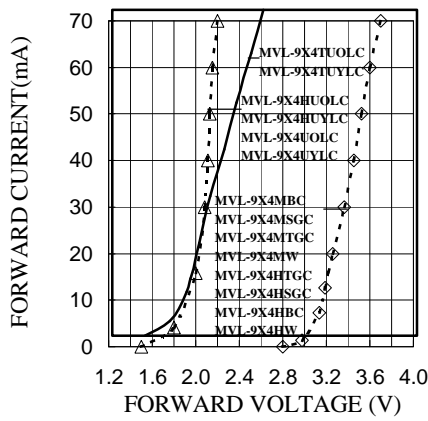


Figure 2. Forward Current vs. Forward Voltage.

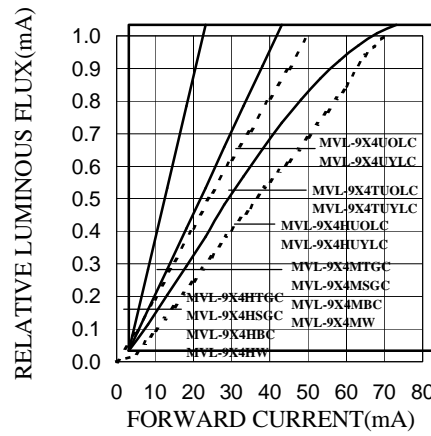


Figure 3. Relative Luminous Flux vs. Forward Current.

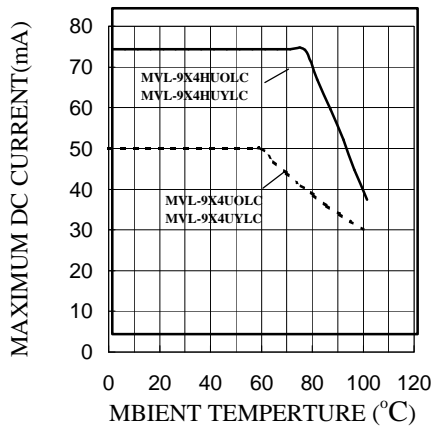


Figure 4a. Maximum DC Forward Current vs. Ambient Temperature.

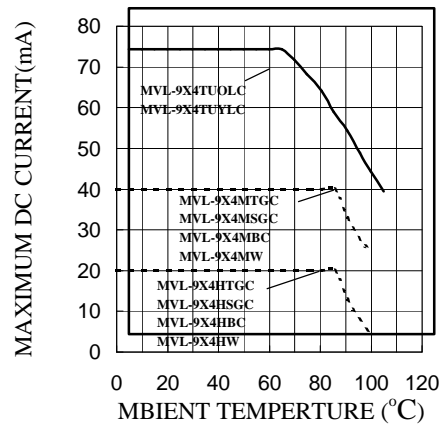


Figure 4b. Maximum DC Forward Current vs. Ambient Temperature.

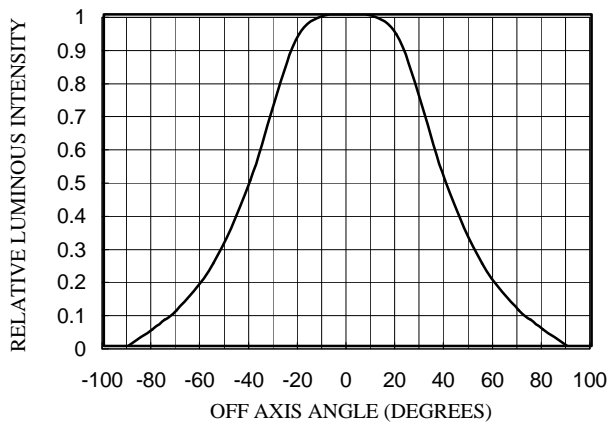


Figure 5. MVL-984HUOLC/MVL-984HUYLC/MVL-984UOLC
MVL-984UYLC/MVL-984MTGC/MVL-984HTGC
MVL-984HSGC/MVL-984HBC
Relative Luminous Intensity vs. Off Axis Angle.

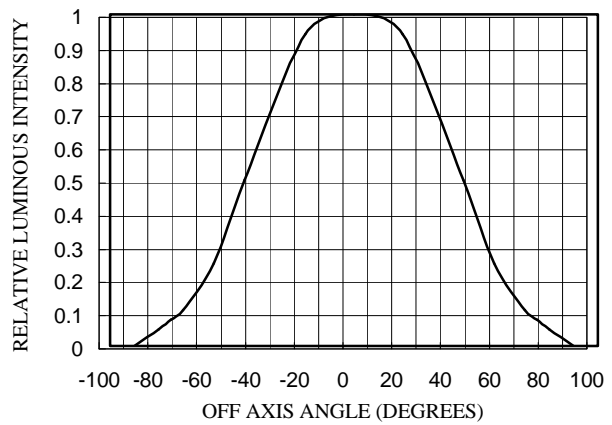


Figure 6. MVL-984MSGC/MVL-984MBC
Relative Luminous Intensity vs. Off Axis Angle.

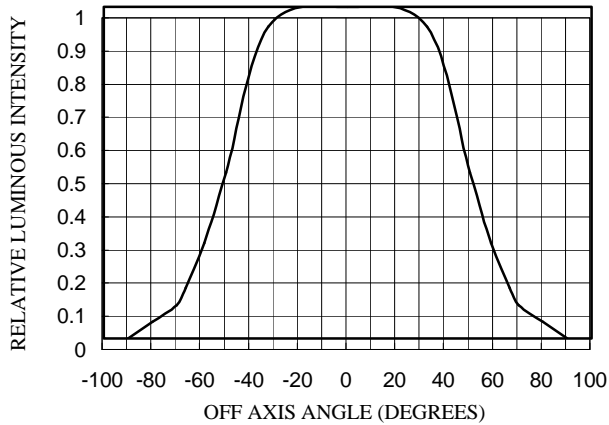


Figure 7. MVL-984TUOLC/MVL-984TUYLC
Relative Luminous Intensity vs. Off Axis Angle.

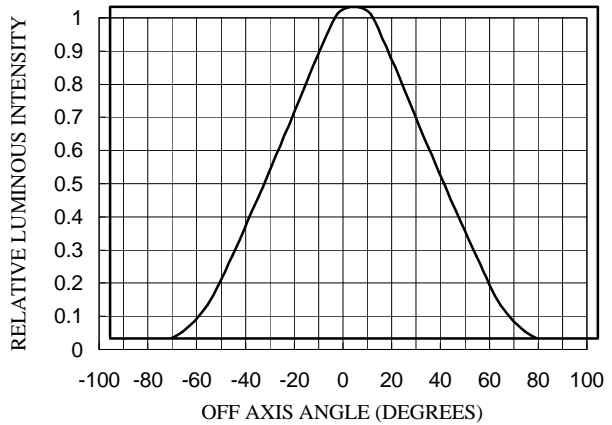


Figure 8. MVL-984MW/MVL-984HW
Relative Luminous Intensity vs. Off Axis Angle.

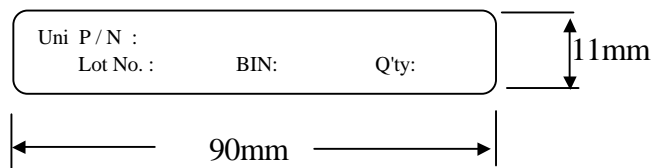
Packaging

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.



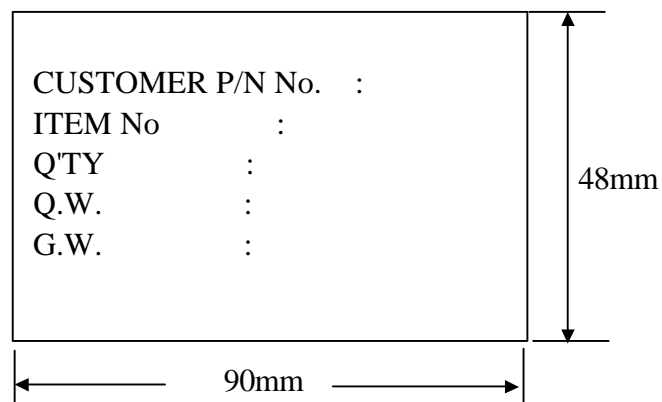
Boxes of LEDs

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	
	MVL-9X4HUOLC MVL-9X4HUYLEC MVL-9X4TUOLC MVL-9X4TUYLC @ $I_F=70\text{mA}$		MVL-9X4MTGC MVL-9X4MSGC MVL-9X4MBC @ $I_F=40\text{mA}$	
	MVL-9X4UOLC MVL-9X4UYLC @ $I_F=50\text{mA}$		MVL-9X4HTGC MVL-9X4HSGC MVL-9X4HBC @ $I_F=20\text{mA}$	
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	5.45		
I	4.5	6.1		
J	5.0	6.7		
K	5.5	7.3		

Dominant Wavelength (in nanometers) @ $I_F=20\text{mA}$										
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	
	MVL-9X4HUOLC MVL-9X4HUYLEC MVL-9X4TUOLC MVL-9X4TUYLC @ $I_F=70\text{mA}$		MVL-9X4MTGC MVL-9X4MSGC MVL-9X4MBC @ $I_F=40\text{mA}$	
	MVL-9X4UOLC MVL-9X4UYLC @ $I_F=50\text{mA}$		MVL-9X4HTGC MVL-9X4HSGC MVL-9X4HBC @ $I_F=20\text{mA}$	
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-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