



## JackLED

### Features

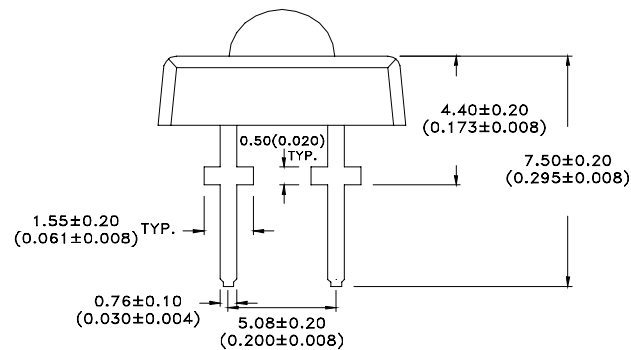
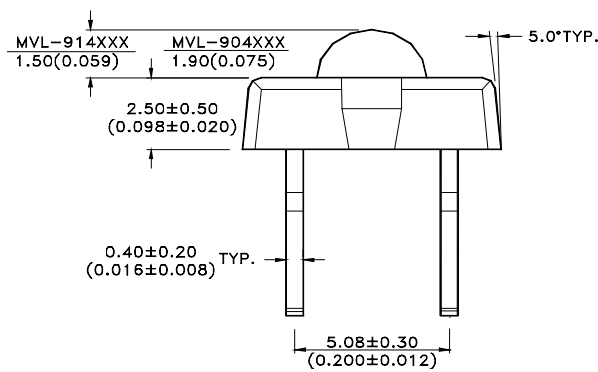
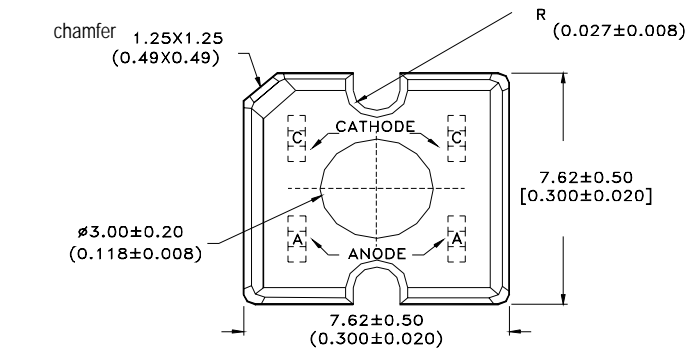
- **Package:** "Piranha" Type With Water Clear Lens
- **Technology:** UOLC - AS AlInGaP RED-ORANGE 620nm  
UYLC - AS AlInGaP AMBER 592nm  
TUOLC - TS AlInGaP RED-ORANGE 620nm  
AUYL - AS AlInGaP AMBER 592nm  
HSOC - AS AlInGaP PURE ORANGE 605nm  
MBC - InGaN On Silicon Carbide BLUE 470nm  
MTGC - InGaN On Silicon Carbide TRUE GREEN 525nm  
MW - InGaN On Silicon Carbide WHITE

- **Packaging:** 60 pieces per tube



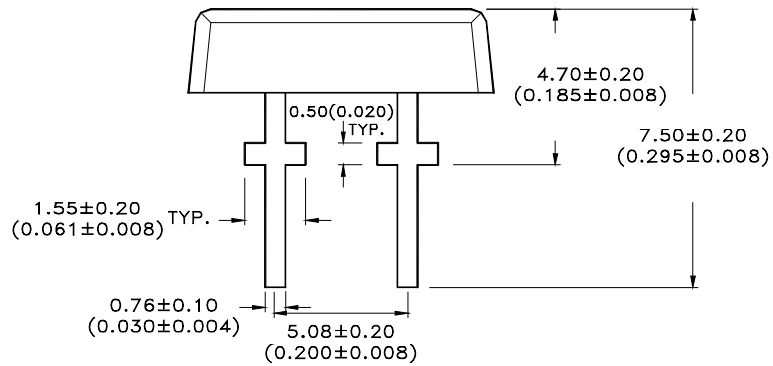
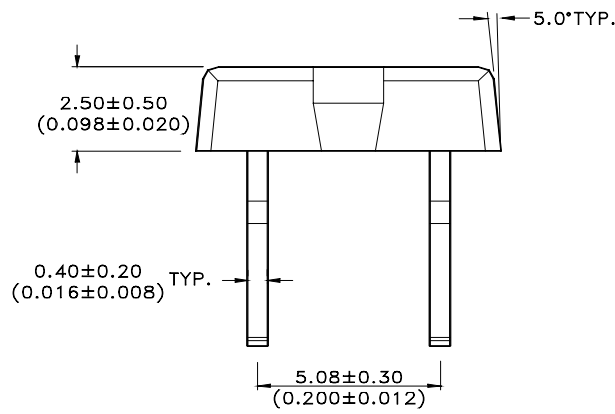
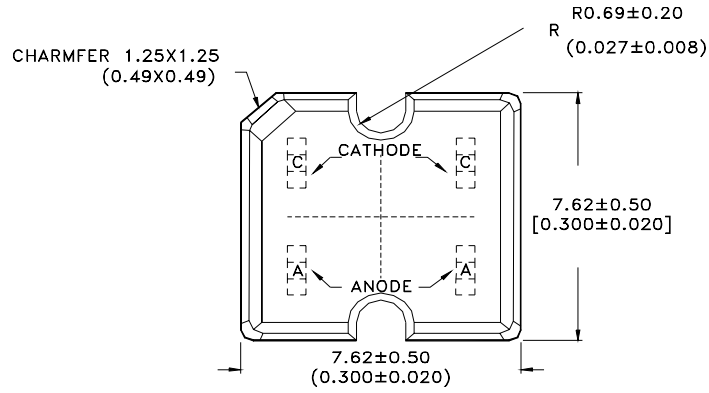
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MVL-904UYLC	MVL-914UYLC	MVL-924UYLC		
MVL-904HSOC	MVL-914HSOC	MVL-924HSOC		
MVL-904TUOLC	MVL-914TUOLC	MVL-924TUOLC	MVL-974TUOLC	MVL-994TUOLC
MVL-904AUYL	MVL-914AUYL	MVL-924AUYL	MVL-974AUYL	MVL-994AUYL
MVL-904MBC	MVL-914MBC	MVL-924MBC		
MVL-904MTGC	MVL-914MTGC	MVL-924MTGC		
MVL-904MW	MVL-914MW	MVL-924MW		

Package Dimensions



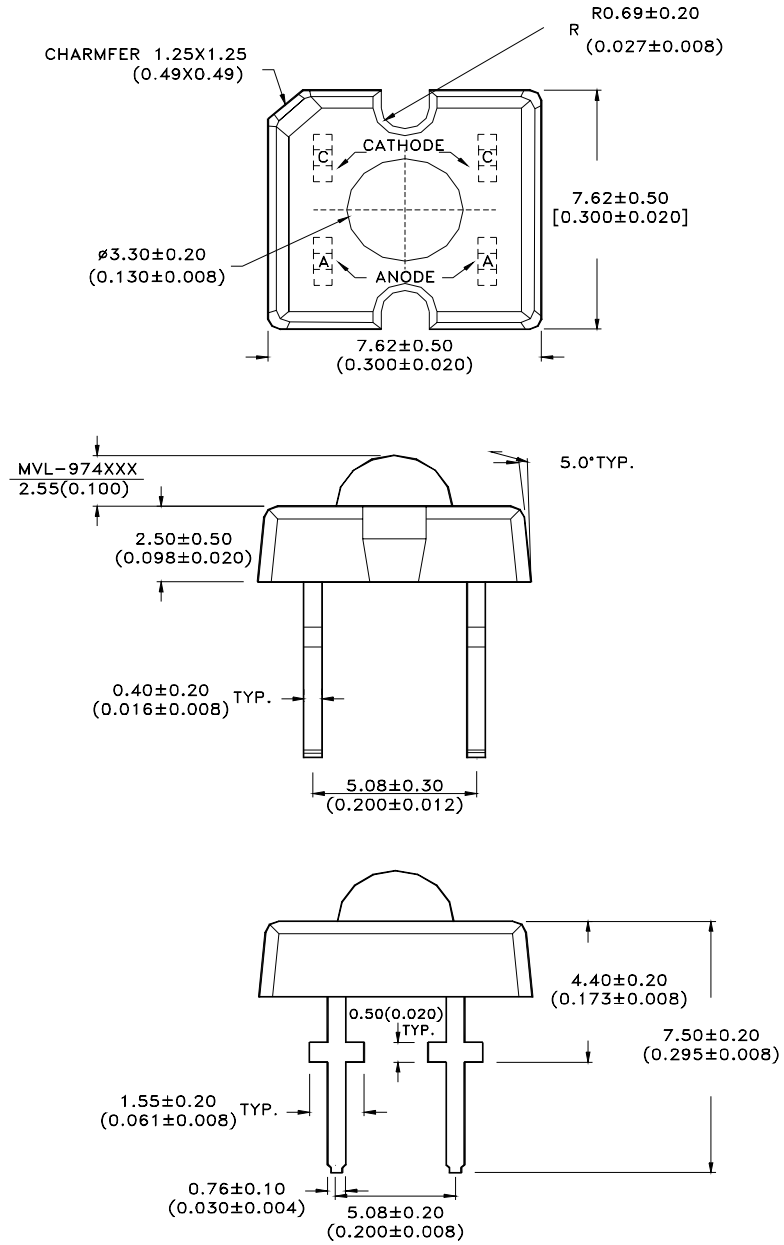
NOTES: 1. Dimensions are in mm (inches)  
2. Dimensions without tolerances are nominal.

Package Dimensions



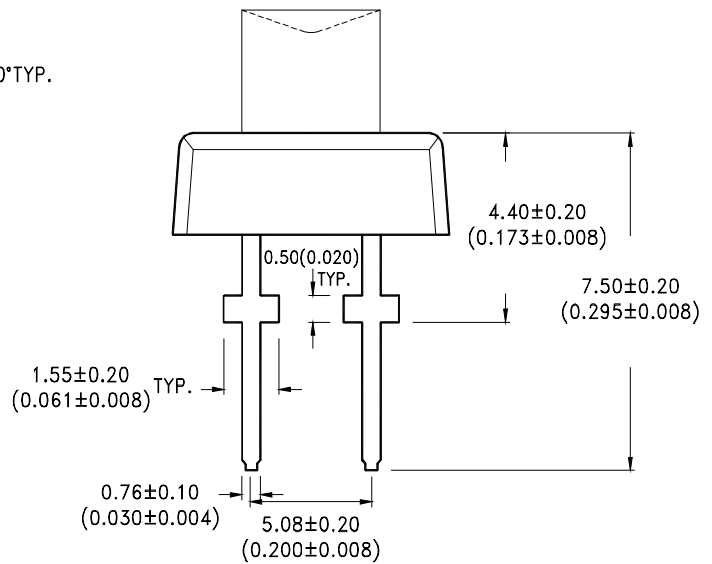
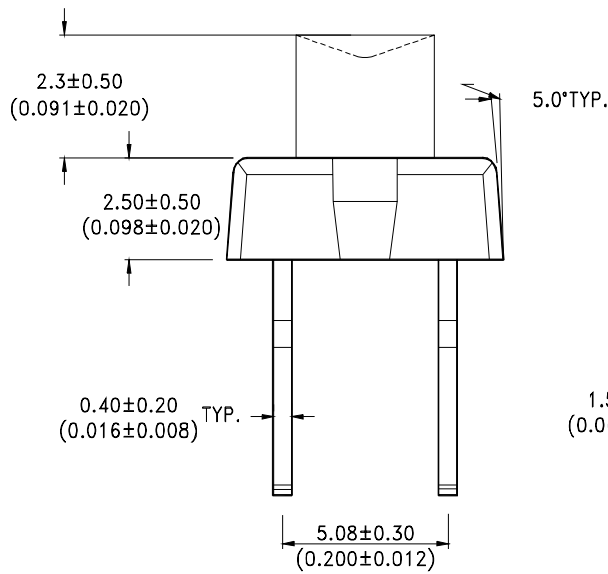
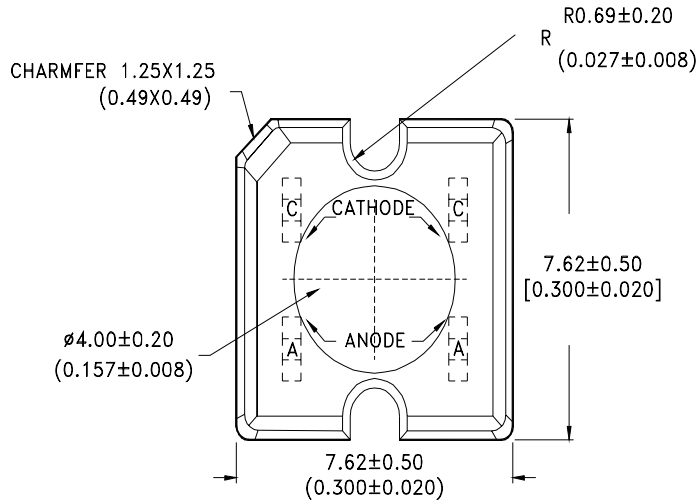
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 2. Dimensions without tolerances are nominal.

Package Dimensions



NOTES: 1.Dimensions are in mm (inches)  
2.Dimensions without tolerances are

**Selection Guide**

Part Number	LED Color	Total Flux θv (mlm) Typ.	View Angle 2θ1/2 (Degrees) Typ.
MVL-904UOLC	AS AlInGaP Red-Orange	1500 @ I <sub>F</sub> = 50mA	50
MVL-904UYLC	AS AlInGaP Amber	1500 @ I <sub>F</sub> = 50mA	50
MVL-904HSOC	AS AlInGaP Pure Orange	2500 @ I <sub>F</sub> = 70mA	50
MVL-904TUOLC	TS AlInGaP Red-Orange	4000 @ I <sub>F</sub> = 70mA	70
MVL-904AUYL	AS AlInGaP Amber	4000 @ I <sub>F</sub> = 70mA	70
MVL-904MBC	InGaN Blue	2000 @ I <sub>F</sub> = 40mA	30
MVL-904MTGC	InGaN True Green	2000 @ I <sub>F</sub> = 40mA	30
MVL-904MW	InGaN White	4000 @ I <sub>F</sub> = 40mA	30
MVL-914UOLC	AS AlInGaP Red-Orange	1500 @ I <sub>F</sub> = 50mA	70
MVL-914UYLC	AS AlInGaP Amber	1500 @ I <sub>F</sub> = 50mA	70
MVL-914HSOC	AS AlInGaP Pure Orange	2500 @ I <sub>F</sub> = 70mA	70
MVL-914TUOLC	TS AlInGaP Red-Orange	4000 @ I <sub>F</sub> = 70mA	100
MVL-914AUYL	AS AlInGaP Amber	4000 @ I <sub>F</sub> = 70mA	100
MVL-914MBC	InGaN Blue	2000 @ I <sub>F</sub> = 40mA	50
MVL-914MTGC	InGaN True Green	2000 @ I <sub>F</sub> = 40mA	50
MVL-914MW	InGaN White	4000 @ I <sub>F</sub> = 40mA	50
MVL-924UOLC	AS AlInGaP Red-Orange	1500 @ I <sub>F</sub> = 50mA	120
MVL-924UYLC	AS AlInGaP Amber	1500 @ I <sub>F</sub> = 50mA	120
MVL-924HSOC	AS AlInGaP Pure Orange	2500 @ I <sub>F</sub> = 70mA	120
MVL-924TUOLC	AS AlInGaP Red-Orange	4000 @ I <sub>F</sub> = 70mA	120
MVL-924AUYL	AS AlInGaP Amber	4000 @ I <sub>F</sub> = 70mA	120
MVL-924MBC	InGaN Blue	2000 @ I <sub>F</sub> = 40mA	120
MVL-924MTGC	InGaN True Green	2000 @ I <sub>F</sub> = 40mA	120
MVL-924MW	InGaN White	4000 @ I <sub>F</sub> = 40mA	120
MVL-974TUOLC	AS AlInGaP Red-Orange	4000 @ I <sub>F</sub> = 70mA	40
MVL-974AUYL	AS AlInGaP Amber	4000 @ I <sub>F</sub> = 70mA	40
MVL-994TUOLC	AS AlInGaP Red-Orange	4000 @ I <sub>F</sub> = 70mA	110
MVL-994AUYL	AS AlInGaP Amber	4000 @ I <sub>F</sub> = 70mA	110

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

Parameter	Device Type			Units
	MVL-9x4UOLC MVL-9x4UYLC	MVL-9x4TUOLC MVL-9x4AUYL MVL-9x4HSOC		
DC Forward Current	50	70		mA
Power Dissipation	180	220		mW
Reverse Voltage (I <sub>R</sub> =100μA)	10	10		V
LED Junction Temperature	125	125		°C
Operating Temp Range	-40 to +100			°C
Storage Temp	-55 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  $T_A=25^{\circ}\text{C}$ 

Part Number	Total Flux $\phi_v$ (mlm)		Peak Wavelength $\lambda_{\text{peak}}$ (nm)	Color, Dominant Wavelength $\lambda_d$ (nm)	Viewing Angle $2\theta$ 1/2 (Degrees)
	Min.	Typ.	Typ.	Typ.	Typ.
	MVL-904UOLC	1000 @ $I_F = 50\text{mA}$	1500 @ $I_F = 50\text{mA}$	625	620
MVL-904UYLC	1000 @ $I_F = 50\text{mA}$	1500 @ $I_F = 50\text{mA}$	596	592	50
MVL-904HSOC	2000 @ $I_F = 70\text{mA}$	2500 @ $I_F = 70\text{mA}$	610	605	50
MVL-904TUOLC	3000 @ $I_F = 70\text{mA}$	4000 @ $I_F = 70\text{mA}$	625	620	70
MVL-904AUYL	3000 @ $I_F = 70\text{mA}$	4000 @ $I_F = 70\text{mA}$	596	592	70
MVL-904MBC	1000 @ $I_F = 40\text{mA}$	2000 @ $I_F = 40\text{mA}$	470	465	30
MVL-904MTGC	1000 @ $I_F = 40\text{mA}$	2000 @ $I_F = 40\text{mA}$	525	520	30
MVL-904MW	2000 @ $I_F = 40\text{mA}$	4000 @ $I_F = 40\text{mA}$	X 0.33	Y 0.31	30
MVL-914UOLC	1000 @ $I_F = 50\text{mA}$	1500 @ $I_F = 50\text{mA}$	625	620	70
MVL-914UYLC	1000 @ $I_F = 50\text{mA}$	1500 @ $I_F = 50\text{mA}$	596	592	70
MVL-914HSOC	2000 @ $I_F = 70\text{mA}$	2500 @ $I_F = 70\text{mA}$	610	605	70
MVL-914TUOLC	3000 @ $I_F = 70\text{mA}$	4000 @ $I_F = 70\text{mA}$	625	620	100
MVL-914AUYL	3000 @ $I_F = 70\text{mA}$	4000 @ $I_F = 70\text{mA}$	596	592	100
MVL-914MBC	1000 @ $I_F = 40\text{mA}$	2000 @ $I_F = 40\text{mA}$	470	465	50
MVL-914MTGC	1000 @ $I_F = 40\text{mA}$	2000 @ $I_F = 40\text{mA}$	525	520	50
MVL-914MW	2000 @ $I_F = 40\text{mA}$	4000 @ $I_F = 40\text{mA}$	X 0.33	Y 0.31	50
MVL-924UOLC	1000 @ $I_F = 50\text{mA}$	1500 @ $I_F = 50\text{mA}$	625	620	120
MVL-924UYLC	1000 @ $I_F = 50\text{mA}$	1500 @ $I_F = 50\text{mA}$	596	592	120
MVL-924HSOC	2000 @ $I_F = 70\text{mA}$	2500 @ $I_F = 70\text{mA}$	610	605	120
MVL-924TUOLC	3000 @ $I_F = 70\text{mA}$	4000 @ $I_F = 70\text{mA}$	625	620	120
MVL-924AUYL	3000 @ $I_F = 70\text{mA}$	4000 @ $I_F = 70\text{mA}$	596	592	120
MVL-924MBC	1000 @ $I_F = 40\text{mA}$	2000 @ $I_F = 40\text{mA}$	470	465	120
MVL-924MTGC	1000 @ $I_F = 40\text{mA}$	2000 @ $I_F = 40\text{mA}$	525	520	120
MVL-924MW	2000 @ $I_F = 40\text{mA}$	4000 @ $I_F = 40\text{mA}$	X 0.33	Y 0.31	120
MVL-974TUOLC	3000 @ $I_F = 70\text{mA}$	4000 @ $I_F = 70\text{mA}$	625	620	40
MVL-974AUYL	3000 @ $I_F = 70\text{mA}$	4000 @ $I_F = 70\text{mA}$	596	592	40
MVL-994TUOLC	3000 @ $I_F = 70\text{mA}$	4000 @ $I_F = 70\text{mA}$	625	620	110
MVL-994AUYL	3000 @ $I_F = 70\text{mA}$	4000 @ $I_F = 70\text{mA}$	596	592	110

Electrical Characteristics at  $T_A=25^{\circ}\text{C}$ 

Device Type	Forward Voltage $V_F$ (Volts)			Reverse Breakdown $V_R$ (Volts) @ $I_R=100\mu\text{A}$		Thermal Resistance $R_{\theta J-PIN}$ ( $^{\circ}\text{C}/\text{W}$ )	Thermal Resistance $R_{\theta J-A}$ ( $^{\circ}\text{C}/\text{W}$ )
	Min.	Typ.	Max	Min.	Typ.	Typ.	Typ.
	MVL-9x4UOLC MVL-9x4UYLC	1.8	2.2 @ $I_F=50\text{mA}$	2.7	10	20	155
MVL-904TUOLC MVL-904AUYL	1.8	2.2 @ $I_F=70\text{mA}$	2.7	10	20	125	250
MVL-904HSOC	1.8	2.2 @ $I_F=70\text{mA}$	2.7	10	20	155	250
MVL-904MBC MVL-904MTGC MVL-904MW	3.0	3.7 @ $I_F=40\text{mA}$	4.2	5	10	130	180

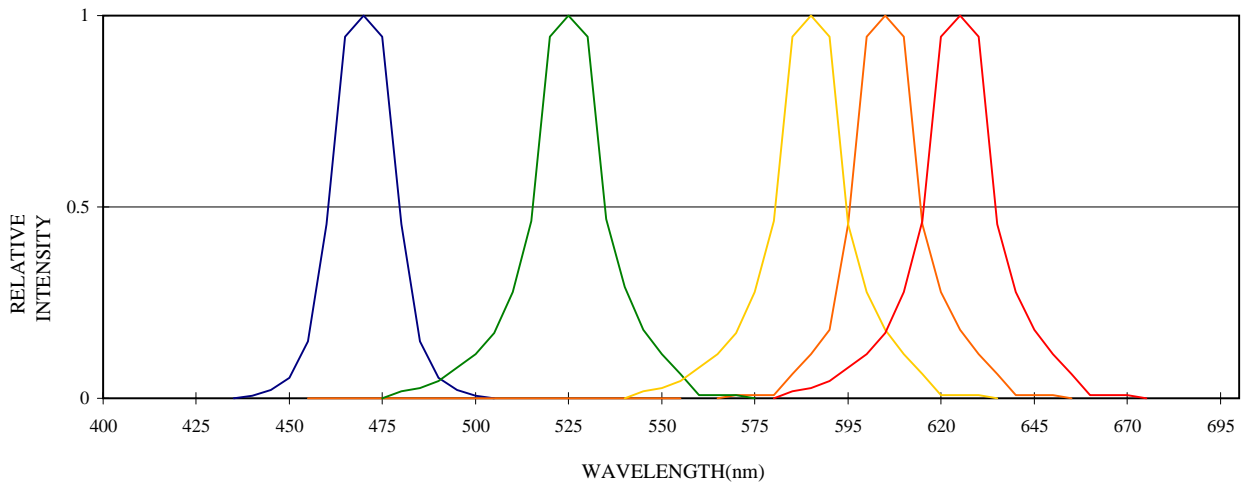


Figure 1. Relative Intensity vs. Wavelength.

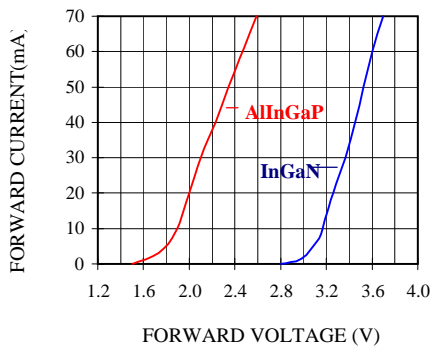


Figure 2. Forward Current vs. Forward Voltage.

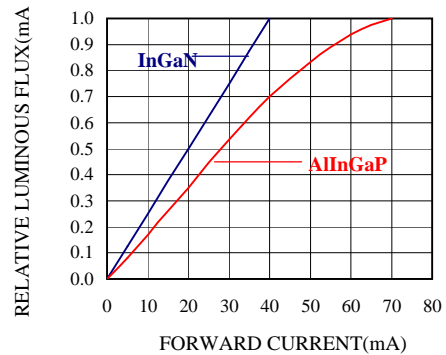


Figure 3. Relative Luminous Flux vs. Forward Current.

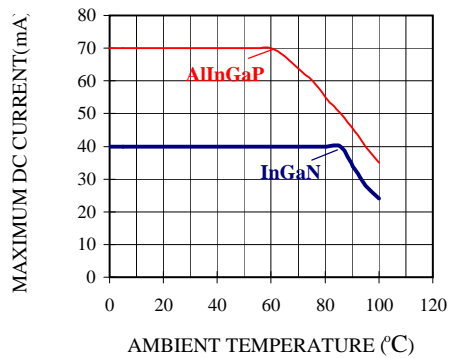
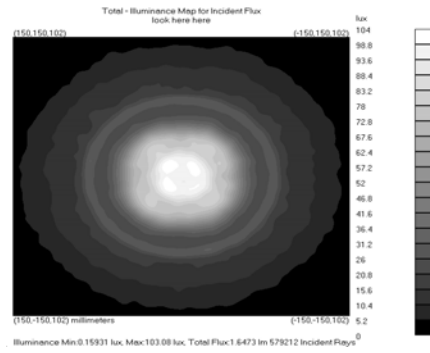
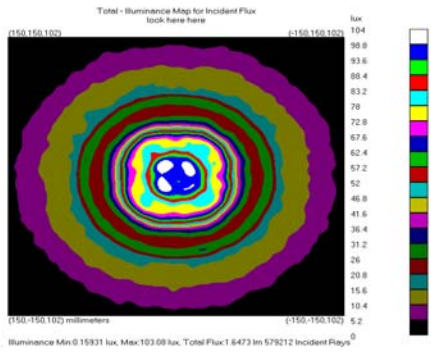
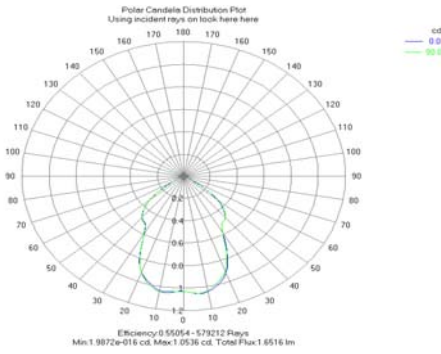
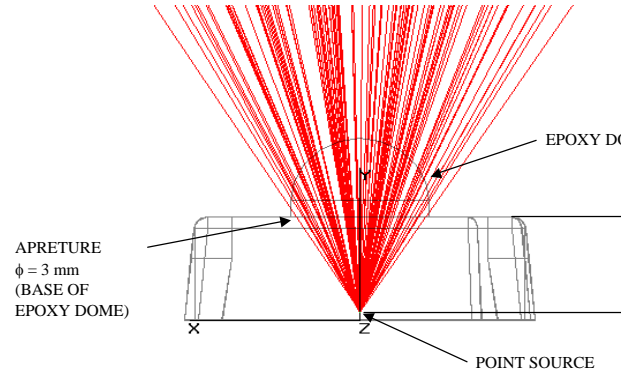
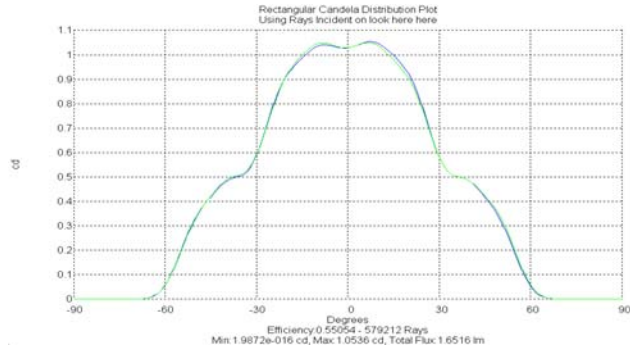
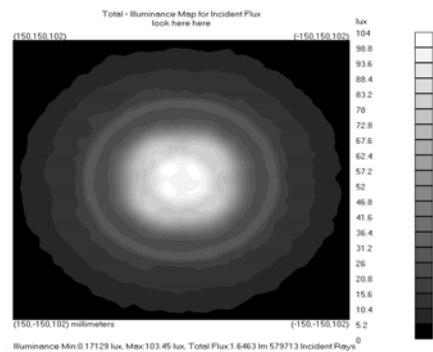
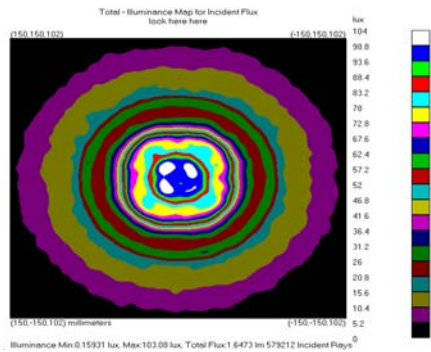
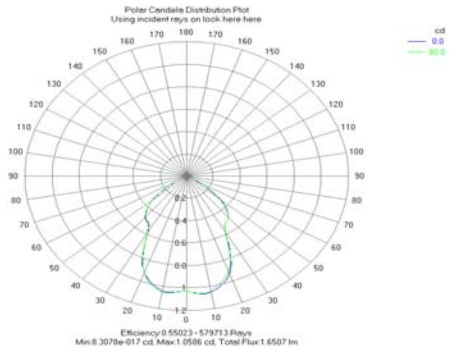
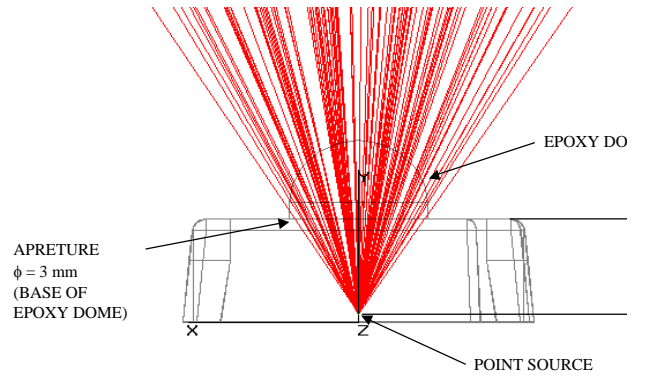
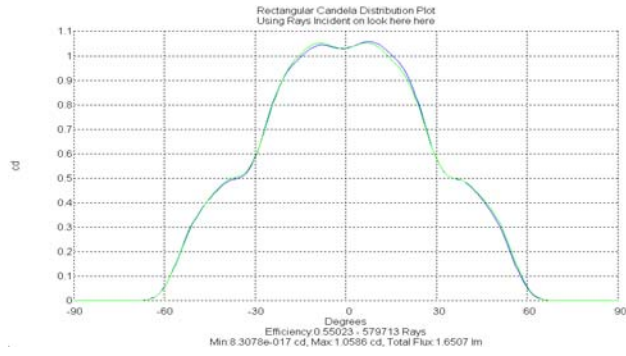
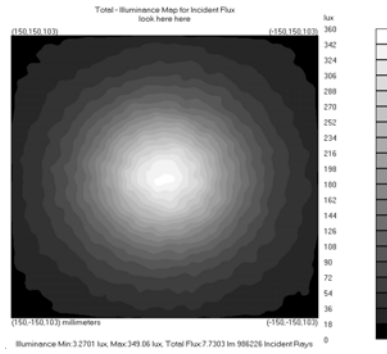
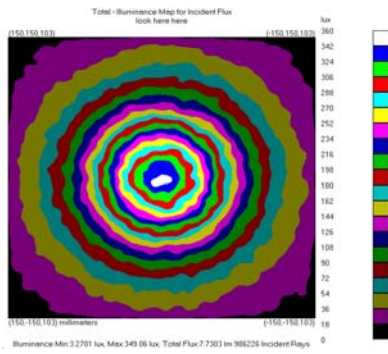
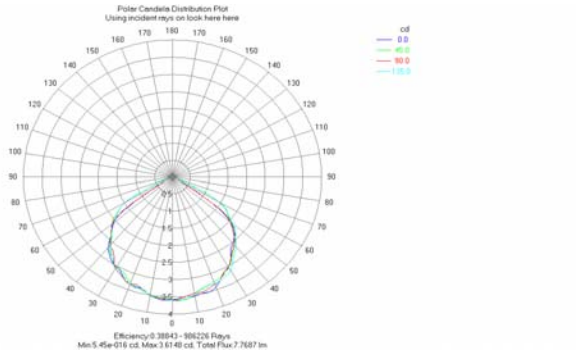
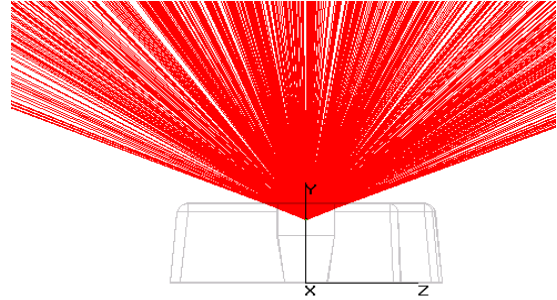
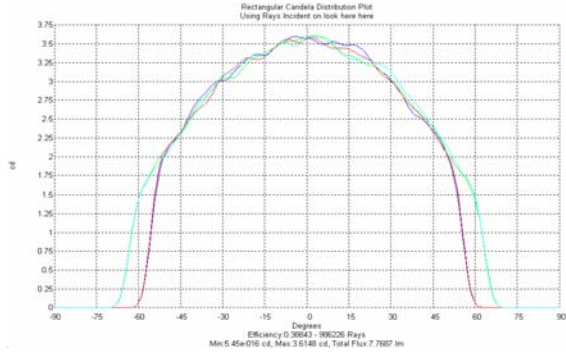


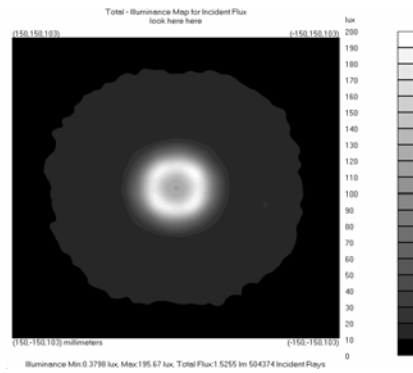
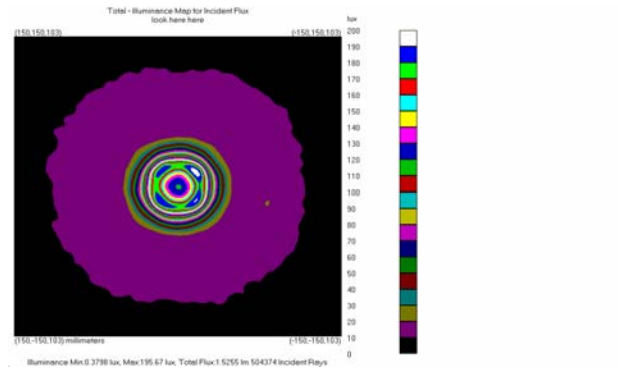
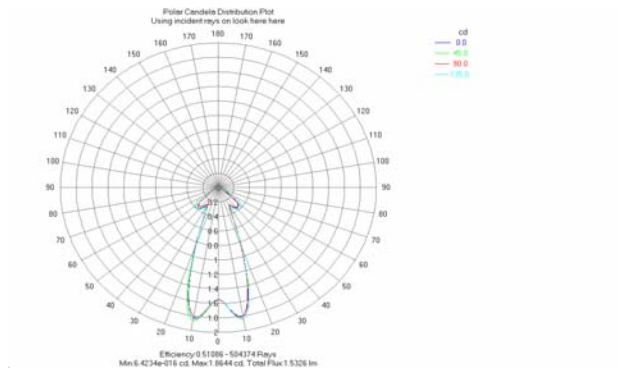
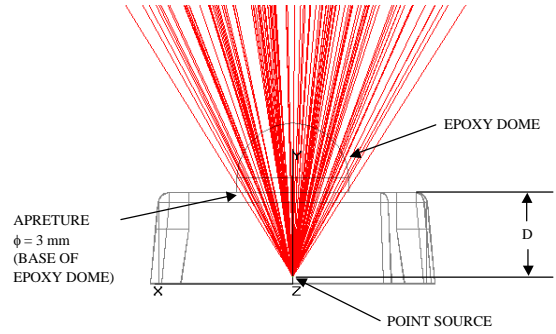
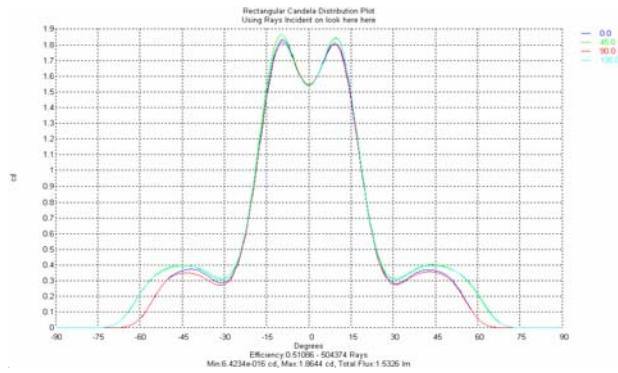
Figure 4b. Maximum DC Forward Current vs. Ambient Temperature.

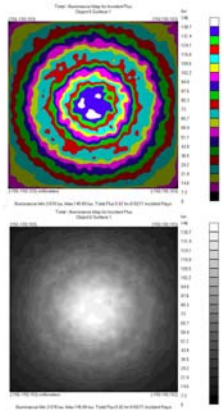
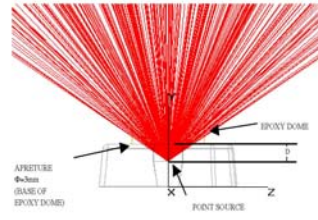
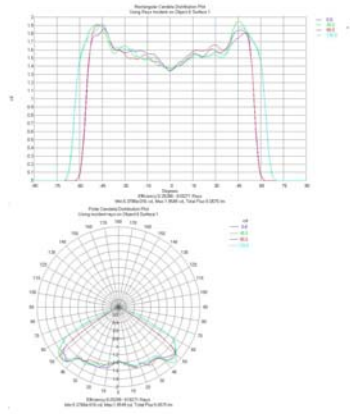












## Unity JackLED Bin Codes

BIN CODE		
H	2	3

Luminous Flux - Lumens				
CODE	AlInGaP @ I <sub>f</sub> = 70mA		InGaN @ I <sub>f</sub> = 40mA	
	MIN	MAX	MIN	MAX
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	3.4
G	3.5	4.8	3.0	3.9
<b>H</b>	<b>4.0</b>	<b>5.5</b>	<b>3.5</b>	<b>4.4</b>
I	4.5	6.1	4.0	4.9
J	5.0	6.7	4.5	5.4
K	5.5	7.3	5.0	5.9

Dominant Wavelength - Nanometers @ I <sub>f</sub> =20mA								
CODE	UOLC / ASOL		UYLC / AUYL		TUOLC		HSOC	
	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX
1	611	618	583	589	609	615	597	603
<b>2</b>	<b>614</b>	<b>622</b>	<b>587</b>	<b>593</b>	<b>615</b>	<b>621</b>	<b>603</b>	<b>609</b>
3	616	634	591	597	621	627	609	615
CODE	MBC		MSGC		MTGC			
	MIN	MAX	MIN	MAX	MIN	MAX		
1	459	469	495	504	517	528		
<b>2</b>	<b>467</b>	<b>475</b>	<b>500</b>	<b>509</b>	<b>524</b>	<b>535</b>		
3	471	481	505	514	531	542		

Forward Voltage - Volts				
CODE	AlInGaP @ I <sub>f</sub> = 70Ma		InGaN @ I <sub>f</sub> = 40mA	
	MIN	MAX	MIN	MAX
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 JackLED White LED Bin Codes**

Category Code		
C	B	3

Luminous Flux (Light-output in lumens)		
MVL-9X4MW @I <sub>f</sub> =40mA		
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
P	8.0	10.3
Q	8.5	10.9
R	9.0	11.5

Chromaticity Coordinates @I <sub>f</sub> =40mA								
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>B</b>	<b>0.273</b>	<b>0.336</b>	<b>0.283</b>	<b>0.353</b>	<b>0.283</b>	<b>0.305</b>	<b>0.273</b>	<b>0.286</b>
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	0.325	0.283	0.345	0.306	0.372	0.306	0.352
F	0.306	0.352	0.306	0.372	0.330	0.400	0.330	0.380
G	0.283	0.305	0.285	0.325	0.306	0.352	0.306	0.332
H	0.306	0.332	0.306	0.352	0.330	0.380	0.330	0.360
I	0.287	0.295	0.283	0.305	0.306	0.332	0.309	0.317
J	0.309	0.317	0.306	0.332	0.330	0.360	0.330	0.339
K	0.296	0.276	0.287	0.295	0.309	0.317	0.313	0.297
L	0.313	0.297	0.309	0.317	0.330	0.339	0.330	0.318
M	0.296	0.256	0.296	0.276	0.313	0.297	0.313	0.277
N	0.313	0.277	0.313	0.297	0.330	0.318	0.330	0.298
O	0.330	0.360	0.330	0.390	0.345	0.402	0.345	0.372
P	0.345	0.372	0.345	0.402	0.361	0.415	0.361	0.385
Q	0.330	0.318	0.330	0.360	0.345	0.372	0.345	0.334
R	0.345	0.334	0.345	0.372	0.361	0.385	0.361	0.351

Chromaticity coordinate groups are tested at a current pulse duration of 25 ms and a tolerance of ±0.01

Forward Voltage (Volts)		
MVL-9X4MW @I <sub>f</sub> =40mA		
BIN CODE	Minimum	Maximum
0	2.2	2.6
1	2.4	2.8
2	2.6	3.0
<b>3</b>	<b>2.8</b>	<b>3.2</b>
4	3.0	3.4
5	3.2	3.6
6	3.4	3.8
7	3.6	4.0
8	3.8	4.2
9	4.0	4.4