

Technical Data  
**Super Flux LEDs for Automotive Lighting**  
 AS AlInGaP

LTL911VRKSA/LTL912VRKSA	Super Red
LTL911VEKSA/LTL912VEKSA	Red
LTL911VHKSA/LTL912VHKSA	Red-Orange
LTL911VYKSA/LTL912VYKSA	Amber

**Benefits**

- ◆ Fewer LEDs required due to AlInGaP technology
- ◆ Lower lighting system cost
- ◆ Higher luminous efficiency than incandescent

**Feature**

- ◆ High current operation / High flux output
- ◆ Low thermal resistance / Low profile
- ◆ Wide viewing angle
- ◆ Meet SAE/ECE/JIS automotive color requirements
- ◆ Tube package for automatic loading and insertion process

**Application**

- ◆ Automotive CHMSL
- ◆ Automotive Stop light / Turn light and other exterior lighting

**Description**

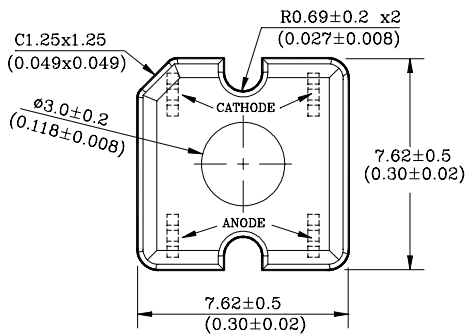
These parts are designed for high current operation and high flux output applications. In order to solve the high temperature produced by the higher current operation, the package's design features better thermal management characteristics than other LED solutions coupled with an efficient optical design.

This package design allows the lighting designer to reduce the number of LEDs required as well as the overall lighting system cost. The low profile package can be easily coupled to reflectors or lenses to efficiently distribute light and provide the desired illuminated appearance. This product family employs the world's brightest super red, red, red-orange and amber LED materials etc., which allow designers to match the color of popular lighting applications, such as automotive tail, stop, and turn signal lamps, and electronic signs. The color specifications meet SAE/ECE/JIS automotive requirements.

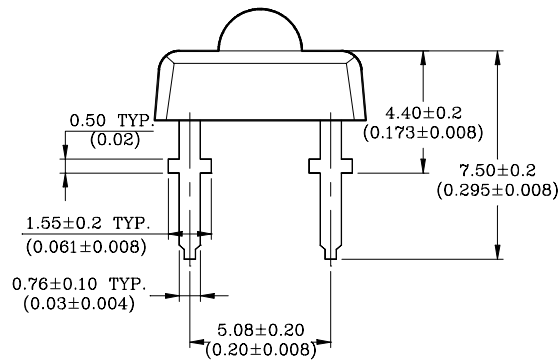
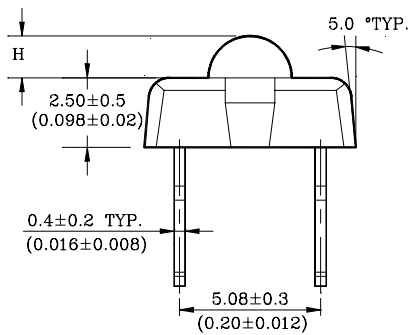
## Devices

Part No. LTL*	Lens		Source	
	Color	Diffusion	Dice Source	Color
911VRKSA/912VRKSA	Water Clear	Non-Diffused	AS AllGaP	Super Red
911VEKSA/912VEKSA	Water Clear	Non-Diffused	AS AllGaP	Red
911VHKSA/912VHKSA	Water Clear	Non-Diffused	AS AllGaP	Red-Orange
911VYKSA/912VYKSA	Water Clear	Non-Diffused	AS AllGaP	Amber

## Package Dimensions



Part No.	H
LTL911XXXXX	1.50(0.059)
LTL912XXXXX	1.90(0.075)



### NOTES:

1. All dimensions are in millimeters (inches).
2. Protruded resin is 1.0mm(.04") max.
3. Lead spacing is measured where the leads emerge from the package.
4. Specifications are subject change to without notice.



**Absolute Maximum Ratings at TA=25°C**

Parameter	Super Red	Red	Red-Orange	Amber	Unit
Power Dissipation	190	190	190	190	mW
Peak Forward Current (1/10 Duty Cycle, 0.1ms Pulse Width)	130	130	90	90	mA
Continuous Forward Current	70	70	70	70	mA
Derating Linear From 70°C	1.17	1.17	1.17	1.17	mA/°C
Reverse Voltage (IR =100 μA)	10	10	10	10	V
Operating Temperature Range	-40°C to + 100°C				
Storage Temperature Range	-55°C to + 100°C				
LED Junction Temperature	125°C				
Soldering Preheat Temperature Lead Soldering Temperature	100°C for 30 Seconds 260°C for 5 Seconds [1.5mm (.06") From Seating Plane]				

Notes:

1. Operation at currents below 10mA is not recommended.
2. Derating linear as shown in Fig. 3

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

Parameter	Symbol	Part No. LTL*	Min.	Typ.	Max.	Unit	Test Condition
Total Flux	∅V	LTL91xVRKSA LTL91xVEKSA LTL91xVHKSA LTL91xVYKSA	1050 1570 1570 1570	1570 2090 2090 2090		mlm	IF = 70mA Note 1
Luminous Intensity / Total Flux	I <sub>v</sub> / ∅V	LTL911VxKSA LTL912VxKSA		0.6 1.2		mcd /mlm	
Viewing Angle	2 θ 1/2	LTL911VxKSA LTL912VxKSA		70 50		deg	Note 2 (Fig.5)
Peak Emission Wavelength	λ <sub>P</sub>	LTL91xVRKSA LTL91xVEKSA LTL91xVHKSA LTL91xVYKSA		639 632 624 598		nm	Measurement @Peak (Fig.1)
Dominant Wavelength	λ <sub>d</sub>	LTL91xVRKSA LTL91xVEKSA LTL91xVHKSA LTL91xVYKSA		631 624 618 595		nm	Note 3
Spectral Line Half- Width	Δ λ	LTL91xVRKSA LTL91xVEKSA LTL91xVHKSA LTL91xVYKSA		20 20 18 16		nm	
Forward Voltage	V <sub>F</sub>		1.85	2.15	2.65	V	IF = 70mA
Reverse Voltage	V <sub>R</sub>		10	20		V	IR = 100 μA
Capacitance	C			40		pF	V <sub>F</sub> = 0 , f = 1MHz
Thermal resistance	R θ <sub>J-PIN</sub>			160		°C/W	

Note: 1. ∅V is the total luminous flux output as measured with an integrating sphere.

2. θ 1/2 is the off-axis angle at which the luminous intensity is half the axial luminous intensity.

3. The dominant wavelength, λ<sub>d</sub> is derived from the CIE chromaticity diagram and represents the single wavelength which defines the color of the device.

## Typical Electrical / Optical Characteristics Curves

(25°C Ambient Temperature Unless Otherwise Noted)

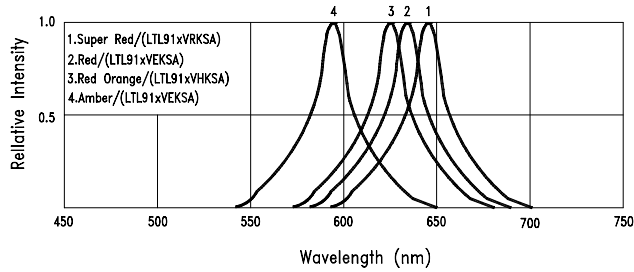


Fig.1 Relative Intensity v.s Wavelength

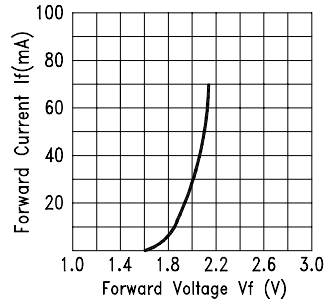


Fig.2 Forward Current v.s Forward Voltage

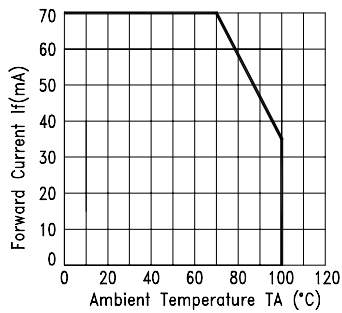


Fig.3 Forward Current v.s Ambient Temperature

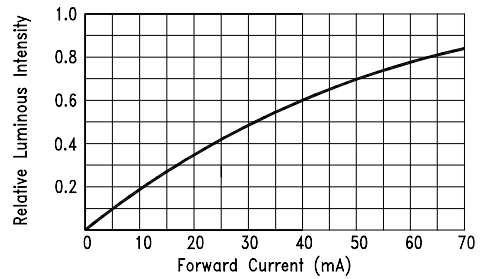


Fig.4 Relative Luminous Intensity v.s Forward Current

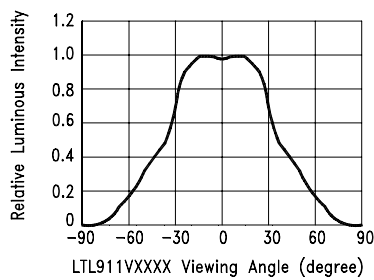


Fig.5-1 Relative Luminous Intensity v.s Off Axis Angle

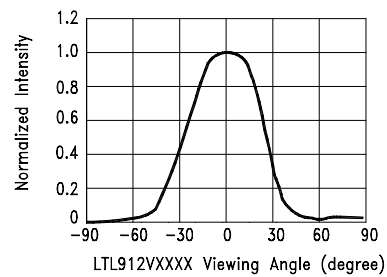


Fig.5-2 Relative Luminous Intensity v.s Off Axis Angle



**Bin Table of Piranha LED**

Bin	Luminous Flux (mlm)	
	Min.	Max.
A	700	1050
B	1050	1570
C	1570	2090
D	2090	2600
E	2600	3130
F	3130	3650
G	3650	4170
H	4170	5300
J	5300	6350
L	6350	8430

Note: Tolerance of each bin limit is  $\pm 15\%$

Bin	LTL91xVHKSA	
	Min.	Max.
H1	613	616
H2	616	619
H3	619	631
Bin	LTL91xVYKSA	
	Min.	Max.
Y2	590	593
Y3	593	596
Y4	596	599
Y5	599	602