



LITE-ON ELECTRONICS, INC.

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Data Sheet

Super Flux LEDs

LTL911SEKSA / LTL912SEKSA
LTL911SHKSA / LTL912SHKSA
LTL911SYKSA / LTL912SYKSA
LTL911TBKS / LTL912TBKS
LTL911TCKS / LTL912TCKS
LTL911TGKS / LTL912TGKS
LTL911TWKS / LTL912TWKS

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Rev. No. : -

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LTL911TGKS	LTL912TGKS
LTL911TWKS	LTL912TWKS



Selection Guide

Part No.	Color	Φ_v (mlm)	Va(deg.)	λ_d (nm)
LTL911SEKSA	Red	3750	90	628
LTL911SHKSA	Red-Orange	3750	90	620
LTL911SYKSA	Amber	2090	90	594
LTL911TBKS	Blue	550	75	470
LTL911TCKS	Cyan	1100	75	505
LTL911TGKS	Green	1600	75	525
LTL911TWKS	White	900	60	0.31/0.32
LTL912SEKSA	Red	3750	60	628
LTL912SHKSA	Red-Orange	3750	60	620
LTL912SYKSA	Amber	2090	60	594
LTL912TBKS	Blue	550	60	470
LTL912TCKS	Cyan	1100	60	505
LTL912TGKS	Green	1600	60	525
LTL912TWKS	White	900	45	0.31/0.32



Benefits

- Fewer LEDs Required
- Lower lighting System Cost

Applications

- Automotive Lighting
 - CHMSL
 - Stop Lamp
 - Rear Turn Signal Lamp
 - Front Turn Signal Lamp
 - Indirect Lighting
- Signs and Signals

Features

- High Current Operation
- High Flux Output
- Low Thermal Resistance
- Low Profile
- Wide Viewing Angle
- Meet SAE/ ECE/ JIS Automotive Color Requirement
- Tube Package for Automatic Loading and Insertion Process

Description

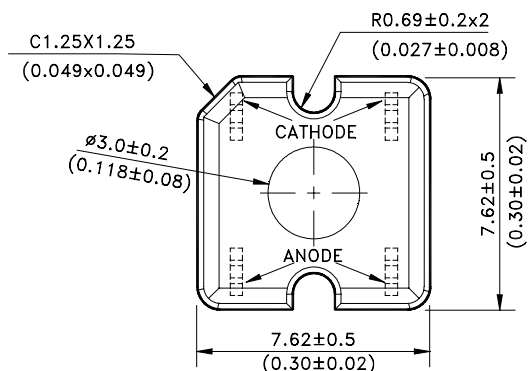
These parts are designed for high current operation and high flux output applications. In order to solve the high temperature produced by the higher current operation, the package's design features better thermal management characteristics than other LED solutions coupled with an efficient optical design.

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 red, red-orange, amber, blue, cyan, green, and white LED materials etc., which allow designers to match the color of popular lighting applications, such as automotive lighting and electronic signs.

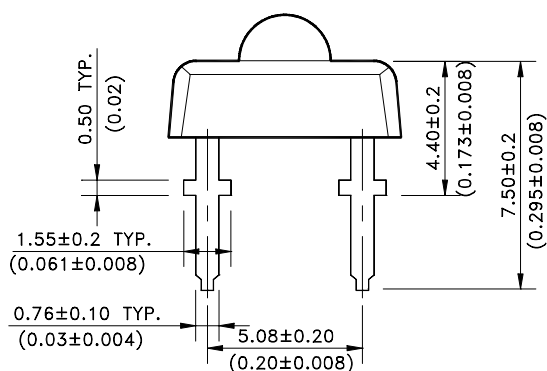
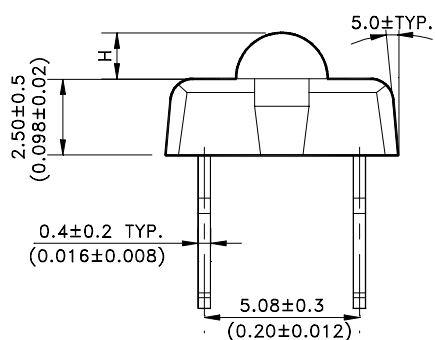
Devices

Part No (LTL*)	Lens		Source	
	Color	Diffusion	Dice Source	Color
911SEKSA/912SEKSA	Water Clear	Non-Diffused	AlInGaP	Red
911SHKSA/912SHKSA	Water Clear	Non-Diffused	AlInGaP	Red-Orange
911SYKSA/912SYKSA	Water Clear	Non-Diffused	AlInGaP	Amber
911TBKS/912TBKS	Water Clear	Non-Diffused	InGaP	Blue
911TCKS/912TCKS	Water Clear	Non-Diffused	InGaP	Cyan
911TGKS/912TGKS	Water Clear	Non-Diffused	InGaP	Green
911TWKS/912TWKS	Water Clear	Non-Diffused	InGaP	White

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	AlInGaP<Note3>	InGaN<Note4>	Unit
Power Dissipation	242	235	mW
Peak Forward Current (1/10 Duty Cycle, 0.1ms Pulse Width)	100	100	mA
Continuous Forward Current	70	50	mA
AlInGaP Derating Linear From 60°C InGaN Derating Linear From 55 °C <Note2>	0.875	0.667	mA/°C
Reverse Voltage (IR =100 μ A)	10	5	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	100°C for 30 Seconds		
Lead Soldering Temperature	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. 4
3. AlInGaP devices: LTL91xSEKSA, LTL91xSHKSA, LTL91xSYKSA.
4. InGaN devices: LTL91xTBKS, LTL91xTCKS, LTL91xTGKS, LTL91xTWKS.

Electrical / Optical Characteristics at T_A=25°C

Parameter	Symbol	Part No.	Min.	Typ.	Max.	Unit	Test Condition
Total Flux <Note1>	ØV	LTL91xSEKSA	1050	3750		mlm	IF=70mA
		LTL91xSHKSA	1050	3750			
		LTL91xSYKSA	1050	2090			
		LTL91xTBKS	310	550			IF=50mA
		LTL91xTCKS	470	1100			
		LTL91xTGKS	700	1600			
		LTL91xTWKS	470	900			
Luminous Intensity / Total Flux	I _v / ØV	LTL911SxKSA		0.6		mcd /mlm	IF=70mA
		LTL912SxKSA		0.9			IF=50mA
		LTL911TBKS / TGKS		1.0			
		LTL912TxKS / TGKS		1.4			
		LTL911TWKS		1.8			
		LTL912TWKS		2.6			
Viewing Angle <Note2, Fig 5>	2 θ 1/2	LTL911SxKSA		90		deg.	
		LTL912SxKSA		60			
		LTL911TxKS		75			
		LTL912TxKS		60			
		LTL911TWKS		60			
		LTL912TWKS		45			
Peak Emission Wavelength <Fig 1>	λ _P	LTL91xSEKSA		638		nm	IF=70mA
		LTL91xSHKSA		626			IF=50mA
		LTL91xSYKSA		596			
		LTL91xTBKS		465			
		LTL91xTCKS		503			
		LTL91xTGKS		518			
Dominant Wavelength <Note 3>	λ _d	LTL91xSEKSA		628		nm	IF=70mA
		LTL91xSHKSA		620			IF=50mA
		LTL91xSYKSA		594			
		LTL91xTBKS		470			
		LTL91xTCKS		505			
		LTL91xTGKS		525			
Chromaticity Coordinates	X	LTL91xTWKS		0.31			IF=50mA
	Y			0.32			
Forward Voltage	VF	LTL91xSxKSA	2.15	2.50	3.45	V	IF=70mA
		LTL91xTxKS	-	4.0	4.7		IF=50mA
Reverse Voltage	VR	LTL91xSxKSA	10	20		V	IR = 100 μA
		LTL91xTxKS	5	10			
Thermal resistance	R _{θ J-PIN}			125		°C/W	

Note: 1. ØV 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_d 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)

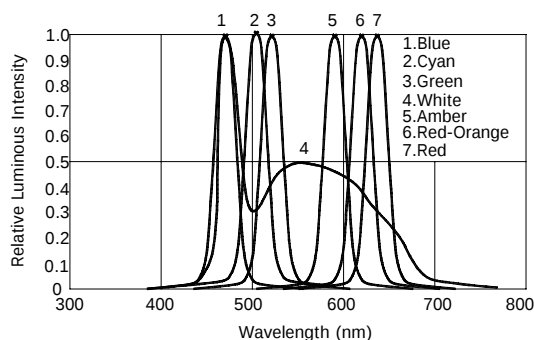


Fig.1 Relative Luminous Intensity vs. Wavelength

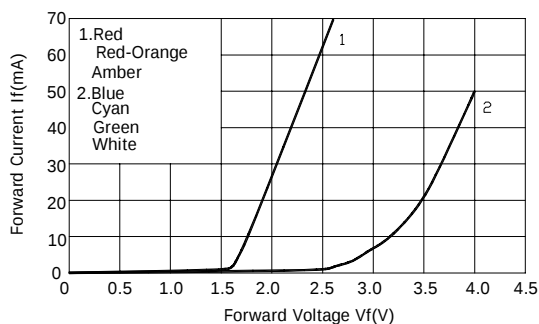


Fig.2 Forward Current vs. Forward Voltage

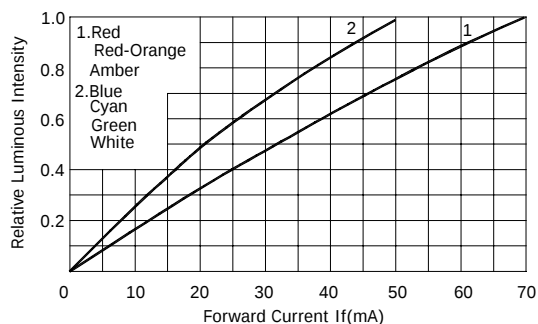


Fig.3 Relative Luminous Flux vs Forward Current

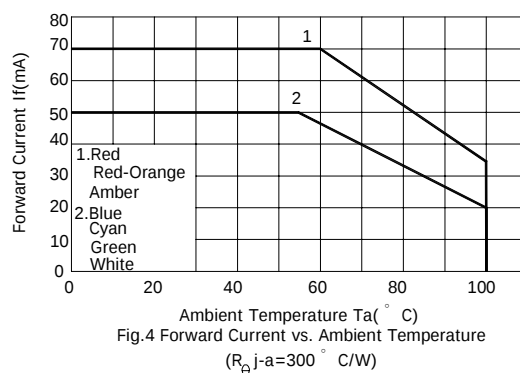


Fig.4 Forward Current vs. Ambient Temperature
($R_{\theta j-a}=300^{\circ}\text{C/W}$)

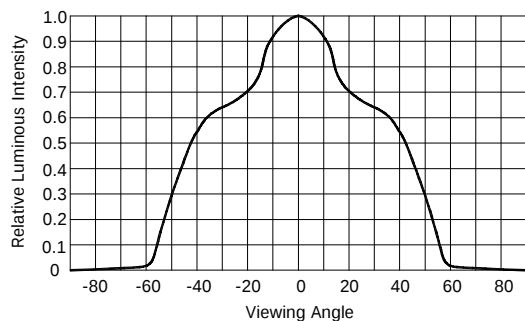


Fig.5a LTL911SxKSA
Relative Luminous Intensity vs. Viewing Angle

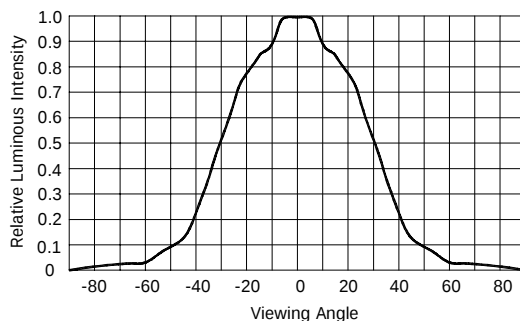


Fig.5b LTL912SxKSA
Relative Luminous Intensity vs. Viewing Angle

Typical Electrical / Optical Characteristics Curves

(25°C Ambient Temperature Unless Otherwise Noted)

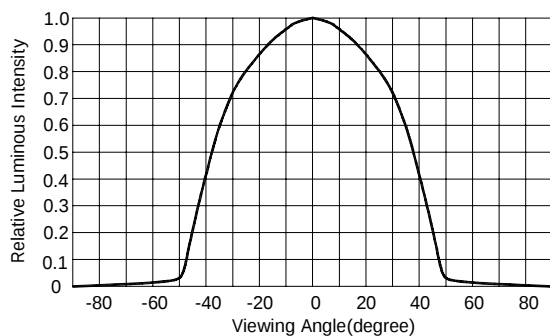


Fig.5c LTL911TxKS (911TBKS/911TCKS/911TGKS)
Relative Luminous Intensity vs. Viewing Angle

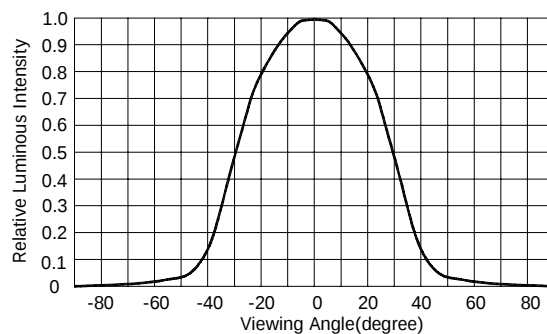


Fig.5d LTL912TxKS (912TBKS/912TCKS/912TGKS)
Relative Luminous Intensity vs. Viewing Angle

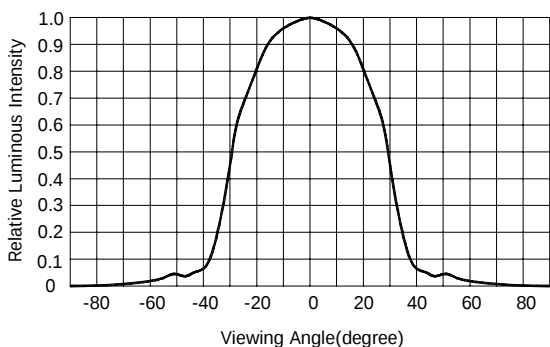


Fig.5e LTL911TWKS
Relative Luminous Intensity vs. Viewing Angle

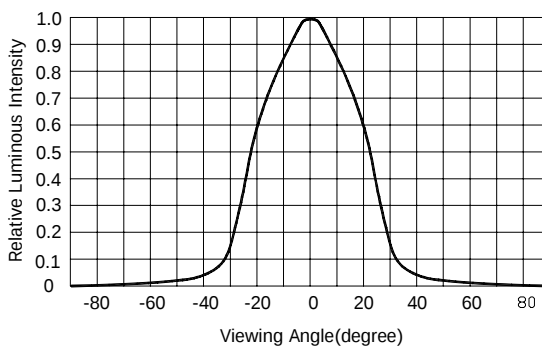


Fig.5f LTL912TWKS
Relative Luminous Intensity vs. Viewing Angle



Bin Table of Piranha LEDs

Bin Code: BIN E HUE H2

1. Luminous Flux Bin Table

Bin	Luminous Flux (lm)	
	Min.	Max.
3X	210	310
3Y	310	470
3Z	470	700
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 $\pm 15\%$

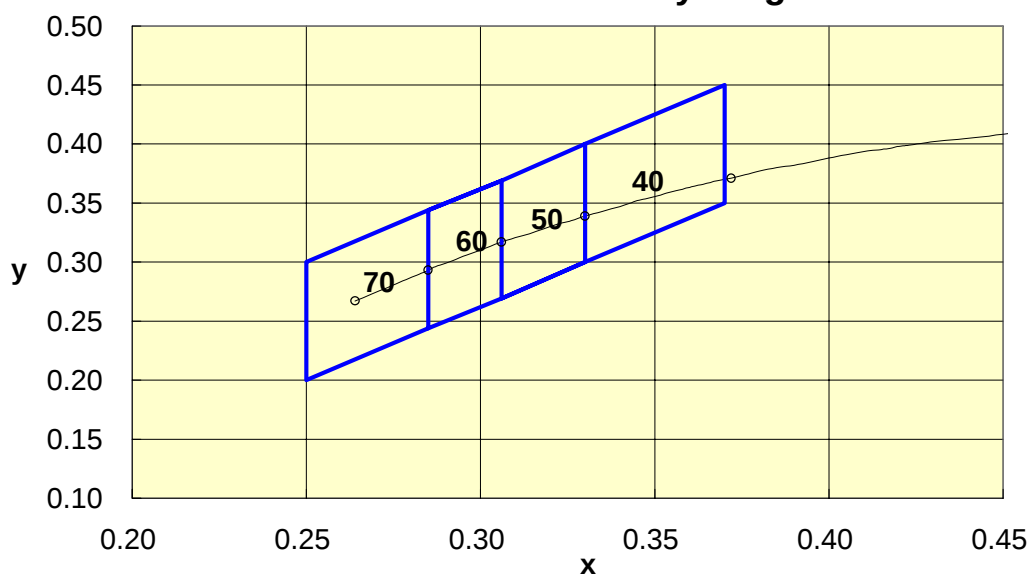
2. Hue Bin Table

Hue Bin	Red-Orange	
	Min.	Max.
H1	613	616
H2	616	619
H3	619	631
Hue Bin	Amber	
	Min.	Max.
Y0	586	588
Y1	588	590
Y2	590	593
Y3	593	596
Y4	596	599
Y5	599	602
Hue Bin	Blue	
	Min.	Max.
B2	460	465
B3	465	470
B4	470	475
B5	475	480
Hue Bin	Cyan	
	Min.	Max.
C1	490	495
C2	495	500
C3	500	505
C4	505	510
Hue Bin	Green	
	Min.	Max.
G1	510	515
G2	515	520
G3	520	525
G4	525	530
G5	530	535
G6	535	540

Note: Tolerance of each bin limit is $\pm 2\text{nm}$

Hue Bin	White					Approximate Color Temp.(K)
40	x	0.370	0.370	0.330	0.330	4200~5600
	y	0.450	0.350	0.300	0.400	
50	x	0.330	0.330	0.306	0.306	5600~7000
	y	0.400	0.300	0.269	0.369	
60	x	0.306	0.306	0.285	0.285	7000~9300
	y	0.369	0.269	0.244	0.344	
70	x	0.285	0.285	0.250	0.250	9300~20000
	y	0.344	0.244	0.200	0.300	

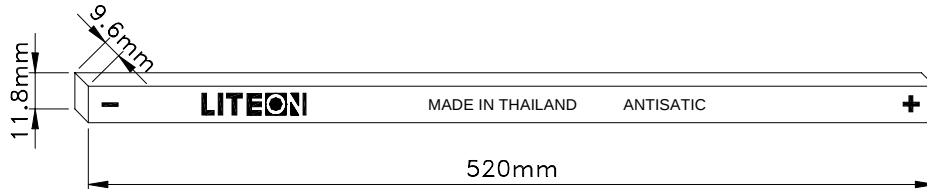
C.I.E. 1931 Chromaticity Diagram



Packing Spec

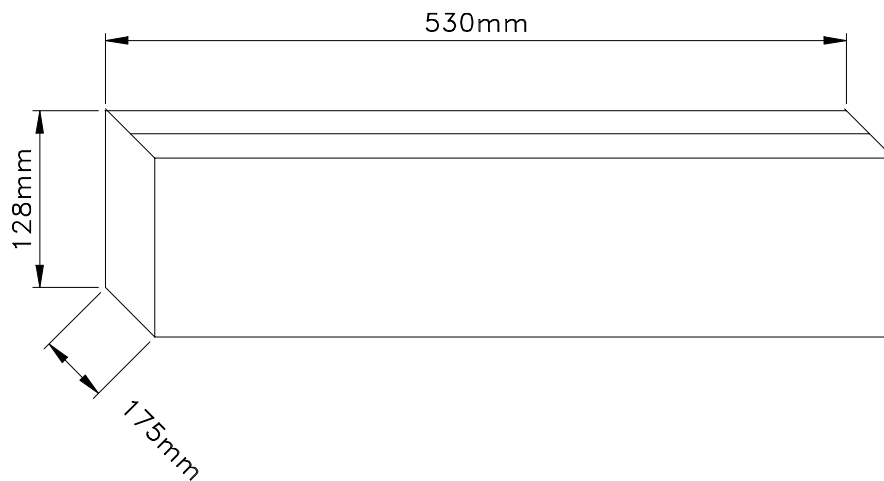
1. Tube: 65pcs

Dim: 520mm x 9.6mm x 11.8mm



2. Inner carton: 187 tubes x 65 pcs = 12,155 pcs

Dim: 530mm x 175mm x 128mm



3. Outer carton: 4 inner cartons x 12,155 pcs = 48,620 pcs

Dim: 545mm x 370mm x 280mm

