

## Features

- 2.15x2.40mm with 1.80mm lens
- High Brightness
- Water Clear/ Diffused lens
- InGaN/ AlGaInP Technology
- Special packaging available upon request
- High reliability

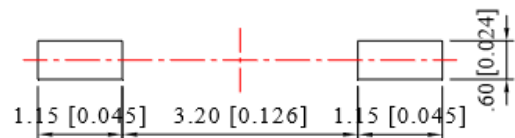
## Applications

- Consumer Electronics
- Variable Message Signs (VMS)
- Automobile After Market
- Industrial Equipment
- Advertising Signs

## Description

The INA-912AXXX.GR series is high brightness SMD Axial LED. It is a 1.8mm Lens type LED which can be used in various applications.

## Recommended Solder Pattern



Unit: mm  
Tolerance:  $\pm 0.10$  mm

Figure 1. INA-912AXXX.GR series Solder Pattern

## Package Dimensions in mm

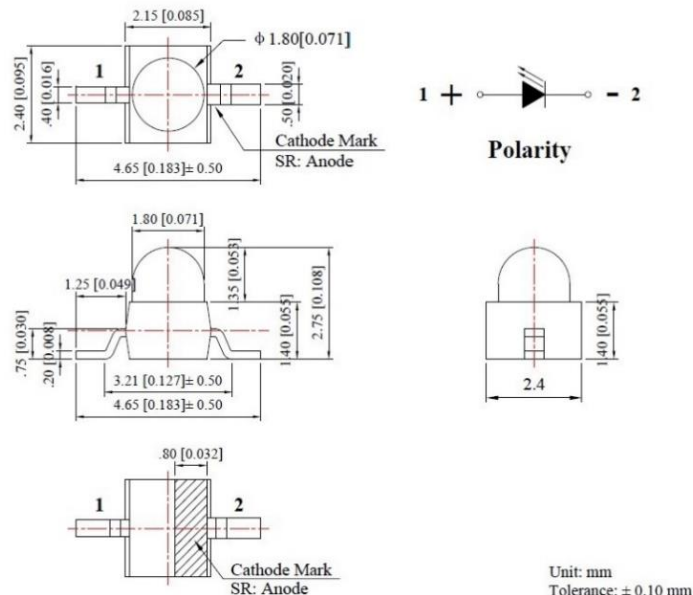


Figure 2. INA-912AXXX.GR series Package Dimensions

### Notes:

1. All dimensions are in millimeters (inches).
2. Tolerance is  $\pm 0.25$  mm (.010") unless otherwise noted.

**Absolute Maximum Rating at 25°C** (Note)

Product	Emission Color	P <sub>d</sub> (mW)	I <sub>F</sub> (mA)	I <sub>FP</sub> * (mA)	V <sub>R</sub> (V)	T <sub>OP</sub> (°C)	T <sub>ST</sub> (°C)
INA-912AY25.GR	Yellow	60	25	100	5	-40°C~+80°C	-40°C~+85°C
INA-912AYG25.GR	Yellow Green	60	25	100	5	-40°C~+80°C	-40°C~+85°C
INA-912AR25.GR	Red	60	25	100	5	-40°C~+80°C	-40°C~+85°C
INA-912AG25.GR	Green	90	25	100	5	-40°C~+80°C	-40°C~+85°C
INA-912AB25.GR	Blue	90	25	100	5	-40°C~+80°C	-40°C~+85°C
INA-912AYUW160.GR	White	90	25	100	5	-40°C~+80°C	-40°C~+85°C

**Notes**

1. Derate linearly as shown in derating curve.
2. Duty Factor = 10%, Frequency = 1 kHz

**Electrical Characteristics**  $T_A = 25^\circ\text{C}$  (Note)

Product	Emission Color	$I_F(\text{mA})$	$V_F(\text{V})$		$\lambda(\text{nm})$			Viewing Angle	$I_v(\text{mcd})$	
			min	max	$\lambda_D$	$\lambda_P$	$\Delta\lambda$		2 $\theta_{1/2}$	min
INA-912AY25.GR	Yellow	20	1.6	2.4	590	592	15	25	1000	2000
INA-912AYG25.GR	Yellow Green	20	1.6	2.4	573	575	20	25	800	1800
INA-912AR25.GR	Red	20	1.6	2.4	624	632	20	25	1000	2000
INA-912AG25.GR	Green	20	2.8	3.6	525	520	35	25	1500	3000
INA-912AB25.GR	Blue	20	2.8	3.6	470	468	25	25	500	1000
INA-912AYUW160.GR	White	20	2.8	3.6	X: 0.31 Y: 0.32	-	-	160	150	500

**Notes**

1. Performance guaranteed only under conditions listed in above tables.
2. Luminous intensity is measured with a light sensor and filter combination that approximates the CIE eye-response curve.
3. 2 $\theta_{1/2}$  is the  $\theta$ -axis angle where the luminous intensity is 1/2 the peak intensity.
4. The dominant wavelength ( $\lambda_D$ ) is derived from the CIE chromaticity diagram and represents the single wavelength which defines the color of the device.

**ESD Precaution**

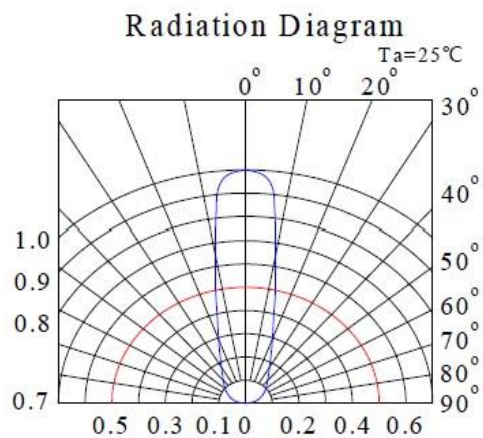
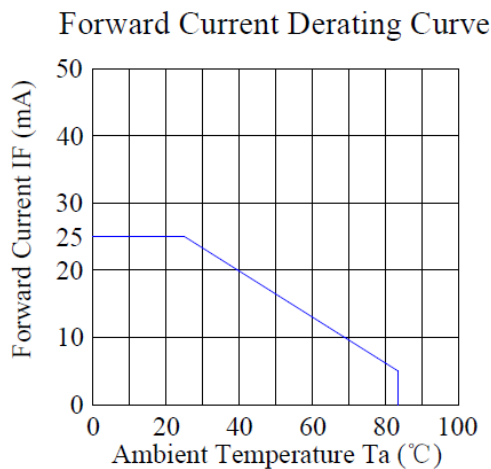
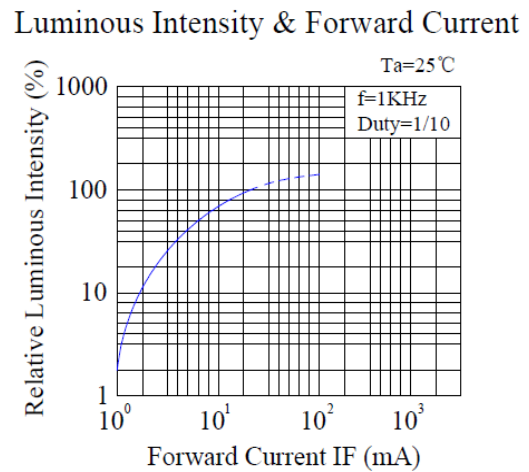
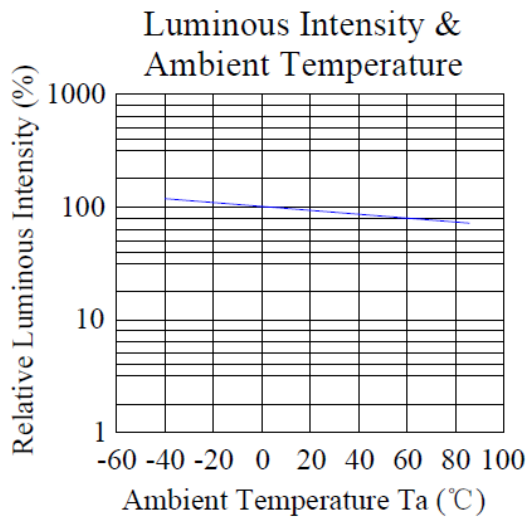
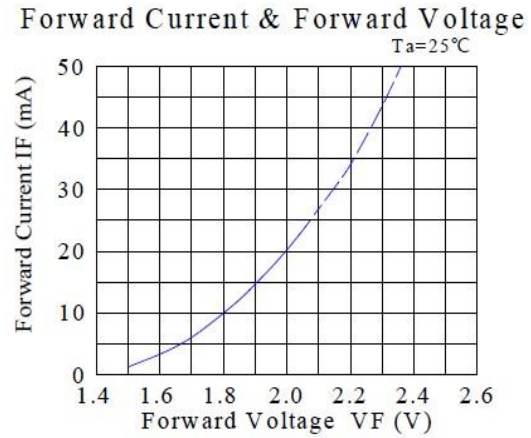
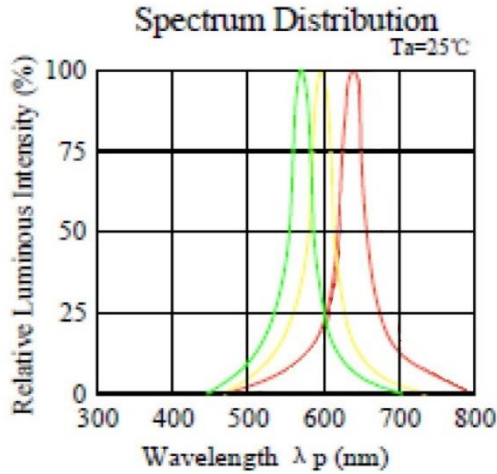
ATTENTION: Electrostatic Discharge (ESD) protection



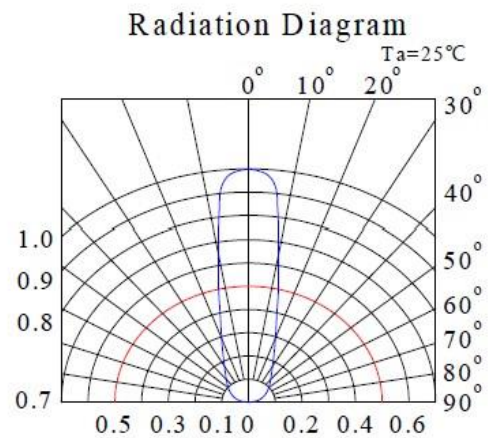
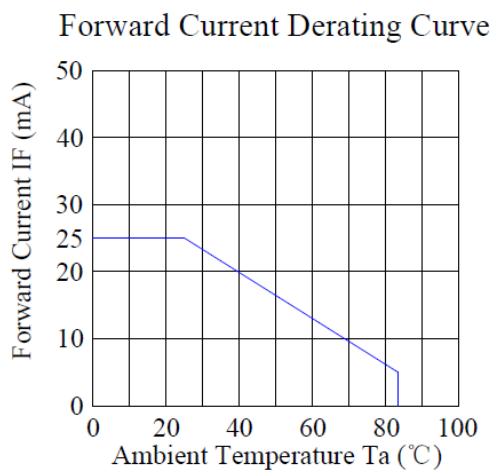
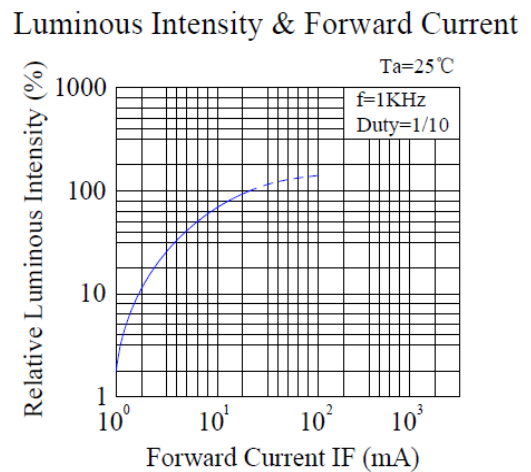
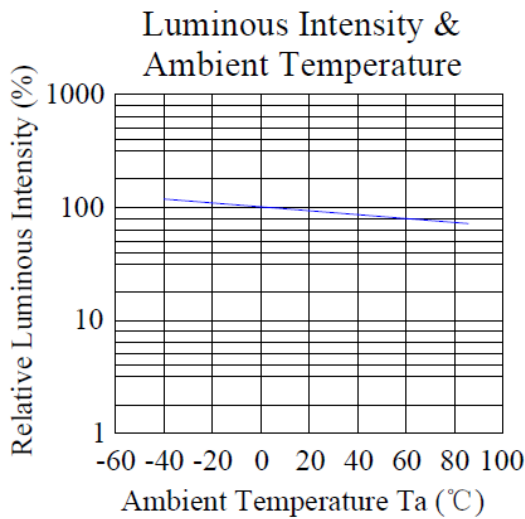
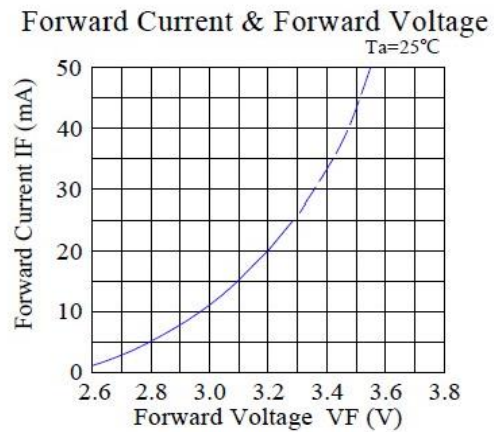
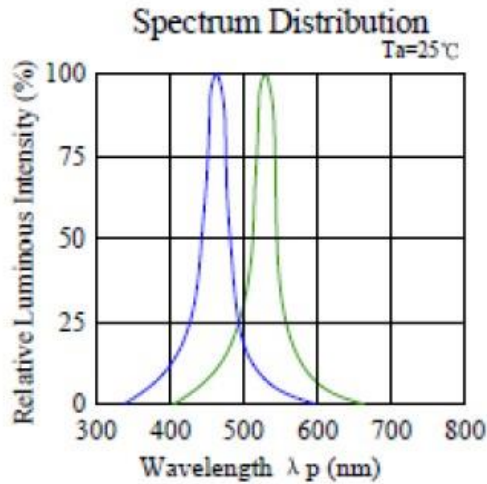
The symbol above denotes that ESD precaution is needed. ESD protection for GaP and AlGaAs based chips is necessary even though they are relatively safe in the presence of low static-electric discharge. Parts built with AlInGaP, GaN, or/and InGaN based chips are STATIC SENSITIVE devices. ESD precaution must be taken during design and assembly.

If manual work or processing is needed, please ensure the device is adequately protected from ESD during the process.

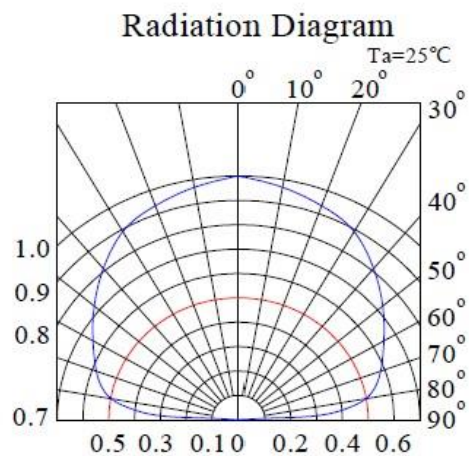
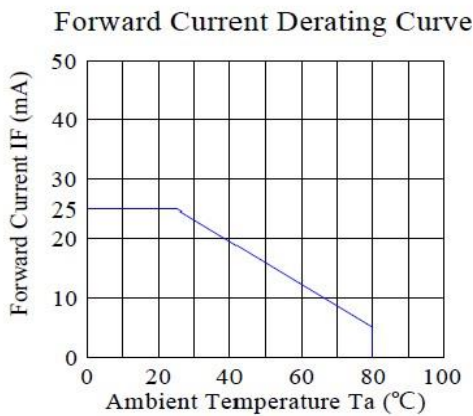
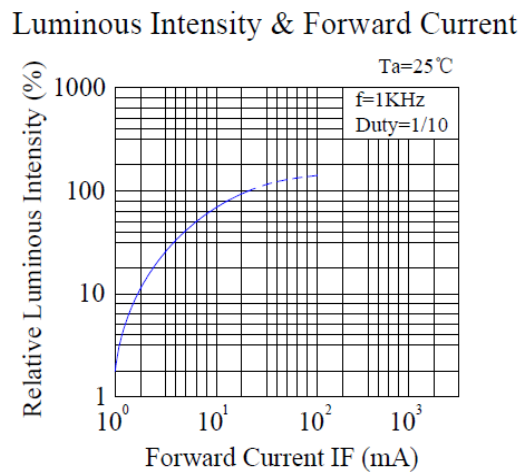
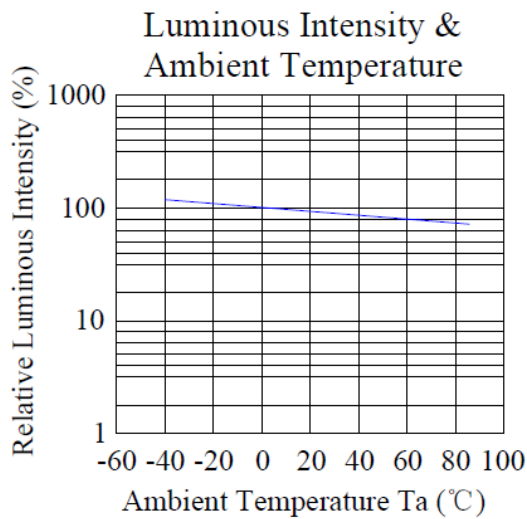
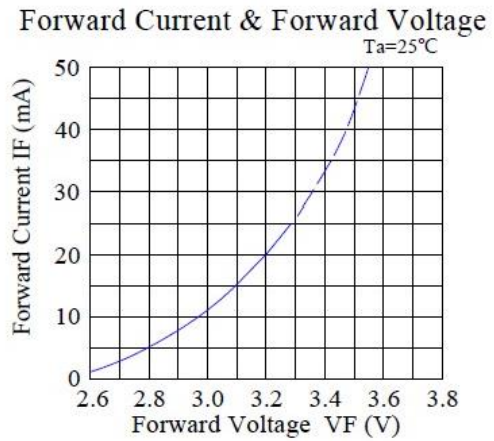
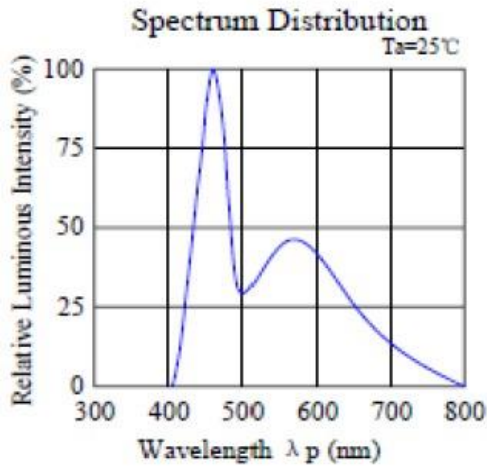
Please be advised that normal static precautions should be taken in the handling and assembly of this device to prevent damage or degradation which may be induced by electrostatic discharge (ESD).

**Typical Characteristic Curves Y, YG, R**


### Typical Characteristic Curves G, B



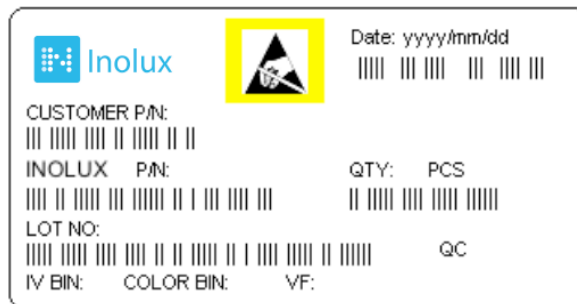
### Typical Characteristic Curves W



## Ordering Information

Product	Emission Color	Technology	Test Current I <sub>F</sub> (mA)	Luminous Intensity I <sub>v</sub> (mcd) (Typ.)	Forward Voltage V <sub>F</sub> (V) (Typ.)	Orderable Part Number
INA-912AY25.GR	Yellow	AlGaInP	20	2000	2.0	INA-912AY25.GR
INA-912AYG25.GR	Yellow Green	AlGaInP	20	1800	2.0	INA-912AYG25.GR
INA-912AR25.GR	Red	AlGaInP	20	2000	2.0	INA-912AR25.GR
INA-912AG25.GR	Green	InGaN	20	3000	3.2	INA-912AG25.GR
INA-912AB25.GR	Blue	InGaN	20	1000	3.2	INA-912AB25.GR
INA-912AYUW160.GR	White	InGaN	20	500	3.2	INA-912AYUW160.GR

## Label Specifications



**Inolux P/N:**

I	N	A	-	912	A	X	X	X	.GR	-	X	X	X	X
				Package	Lens	Color	View Angle	Leadframe type	Customized Stamp-off					
Inolux Leadframe Axial				912A = Lead frame Axial	(Blank) = Clear Lens  YU = Yellow Diffused	Y = 590nm YG = 570nm R = 624nm G = 520nm B = 470nm W = x: 0.31 y: 0.32	25 = 25 deg. 160 = 160 deg.	GR = Gullwing						

**Lot No.:**

Z	2	0	1	7	01	24	001
Internal Tracker	Year (2017, 2018, .....)				Month	Date	Serial



## Reliability

Item	Frequency/ lots/ samples/ failures	Standards Reference	Conditions
Precondition	For all reliability monitoring tests according to JEDEC Level 2	J-STD-020	1.) Baking at 85°C for 24hrs 2.) Moisture storage at 85°C/ 60% R.H. for 168hrs
Solderability	1Q/ 1/ 22/ 0	JESD22-B102-B And CNS-5068	Accelerated aging 155°C/ 24hrs Tinning speed: 2.5+0.5cm/s Tinning: A: 215°C/ 3+1s or B: 260°C/ 10+1s
Resistance to soldering heat		CNS-5067	Dipping soldering terminal only Soldering bath temperature A: 260+/-5°C; 10+/-1s B: 350+/-10°C; 3+/-0.5s
Operating life test	1Q/ 1/ 40/ 0	CNS-11829	1.) Precondition: 85°C baking for 24hrs 85°C/ 60%R.H. for 168hrs 2.) Tamb25°C; IF=20mA; duration 1000hrs
High humidity, high temperature bias	1Q/ 1/ 45/ 0	JESD-A101-B	Tamb: 85°C Humidity: 85% R.H., IF=5mA Duration: 1000hrs
High temperature bias	1Q/ 1/ 20	IN specs.	Tamb: 55°C IF=20mA Duration: 1000hrs
Pulse life test	1Q/ 1/ 40/ 0		Tamb25°C, If=20mA,, Ip=100mA, Duty cycle=0.125 (tp=125 μs, T=1sec) Duration 500hrs)
Temperature cycle	1Q/ 1/ 76/ 0	JESD-A104-A IEC 68-2-14, Nb	A cycle: -40 degree C 15min; +85 degree C 15min Thermal steady within 5 min.. 300 cycles 2 chamber/ Air-to-air type
High humidity storage test	1Q/ 1/ 40/ 0	CNS-6117	60+3°C 90+5/-10% R.H. for 500hrs
High temperature storage test	1Q/ 1/ 40/ 0	CNS-554	100+10°C for 500hrs
Low temperature storage test	1Q/ 1/ 40/ 0	CNS-6118	-40+5°C for 500hrs

## Revision History

Changes since last revision	Page	Version No.	Revision Date
Initial Release		1.0	06-15-2020

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2. A critical component in any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.