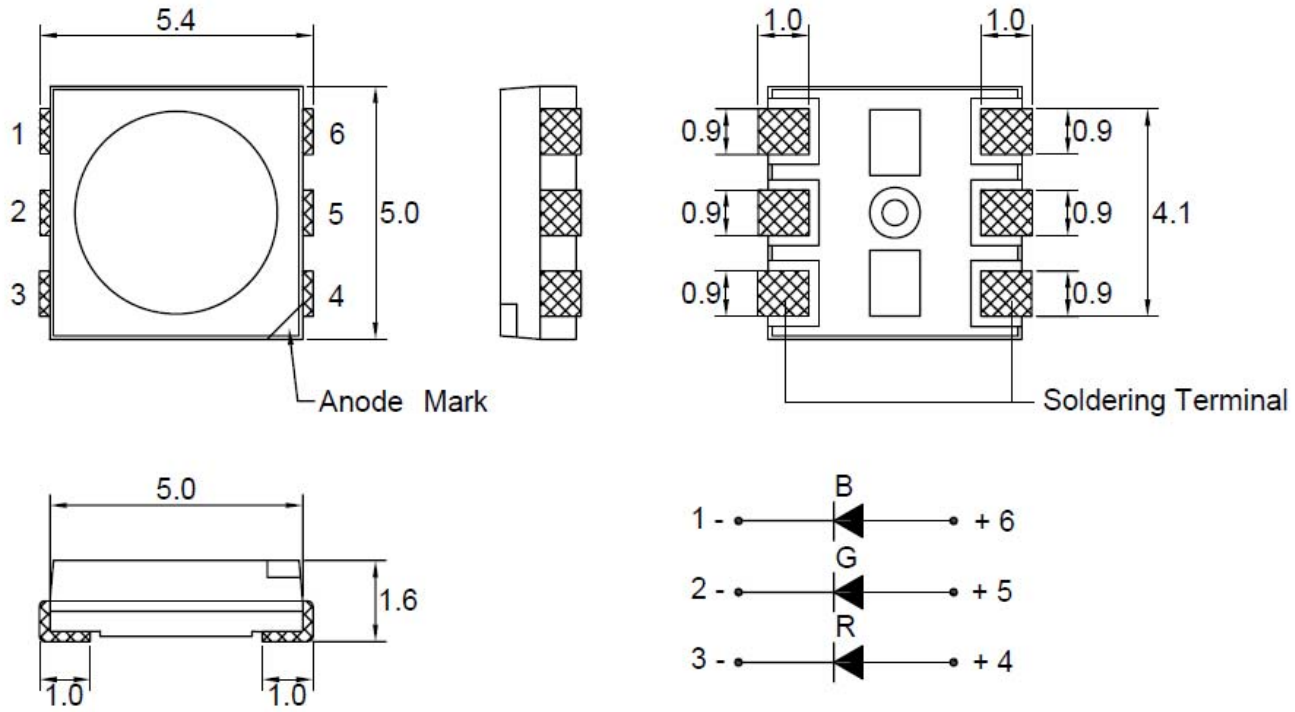
American Opto Plus LED Corp.
L950L-QBNPGLE

5.4 x 5.0 x 1.6 mm RGB SMD LED

PACKAGE SPECIFICATIONS

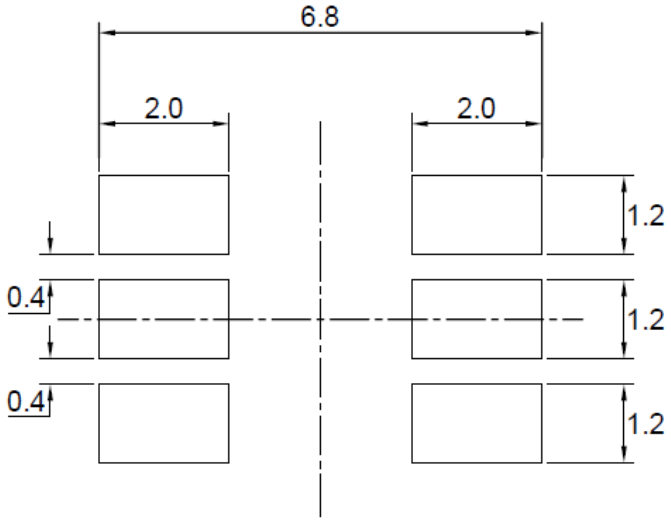


Notes:

1. All dimensions in mm.
2. Tolerance is ±0.2mm unless otherwise noted.

Part No.	Emission Color	Material	Lens
L950L-QBNPGLE	Red	AlGaInP	Water Clear
	Blue	InGaN	
	Green	InGaN	

RECOMMENDED SOLDER PATTERN



ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

Parameter	Symbol	Ratings			Unit
		R	PG	B	
DC Forward Current	I_F	50	30	30	mA
Peak Pulsed Current Duty 1/10@10KHz	I_{FP}	90	100	100	mA
Power Dissipation	P_D	130	108	108	mW
Reverse Current @ 5V	I_R	10	50	50	μA
Electrostatic Discharge	ESD	2000	500	500	V
Operating temperature range	T_{OPR}	-20~+80			°C
Storage temperature range	T_{STG}	-30~+100			°C

OPTICAL-ELECTRICAL CHARACTERISTICS (Ta=25°C)

Parameter	Symbol	Condition		Min	Typ	Max	Unit
Luminous Intensity	I_V	I_F=20mA	R PG B	500 800 125	800 1250 320	--	mcd
Dominant Wavelength	λ_D		R PG B	--	624 525 470	--	nm
Spectral Line Half-Width	$\Delta\lambda$		R PG B	--	20 36 30	--	nm
Forward Voltage	V_F		R PG B	1.7 2.8 2.8	--	2.6 3.6 3.6	V
Viewing Angle	2θ½		All	--	120	--	deg

Notes:

1. Luminous intensity tolerance: ±15%
2. Forward voltage tolerance: ±0.1V

LUMINOUS INTENSITY CLASSIFICATION

BIN CODE		Iv(mcd) at 20mA	
		Min.	Max.
RED	U	500	800
	V-1	800	1000
	V-2	1000	1250

BIN CODE		Iv(mcd) at 20mA	
		Min.	Max.
GREEN	V-1	800	1000
	V-2	1000	1250
	W-1	1250	1600

BIN CODE		Iv(mcd) at 20mA	
		Min.	Max.
BLUE	R	125	200
	S	200	320
	T	320	500

DOMINANT WAVELENGTH CLASSIFICATION

BIN CODE		λD(nm) at 20mA	
		Min.	Max.
RED	27	618	621
	28	621	624
	29	624	627
	30	627	630

BIN CODE		λD(nm) at 20mA	
		Min.	Max.
GREEN	1O	519	522
	1P	522	525
	1Q	525	528
	1R	528	531

BIN CODE		λD(nm) at 20mA	
		Min.	Max.
BLUE	0D	465	468
	0C	468	471
	0B	471	474

TYPICAL ELECTRICAL-OPTICAL CHARACTERISTIC CURVES (RED)

Fig.1 Forward current vs. Forward Voltage

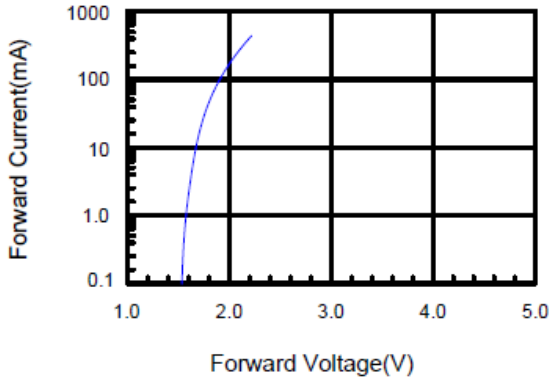


Fig.2 Relative Intensity vs. Forward Current

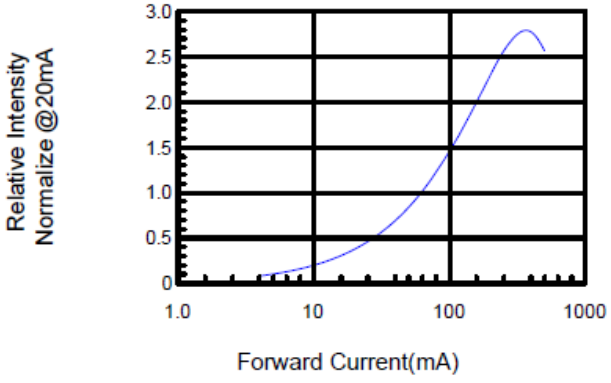


Fig.3 Forward Voltage vs. Temperature

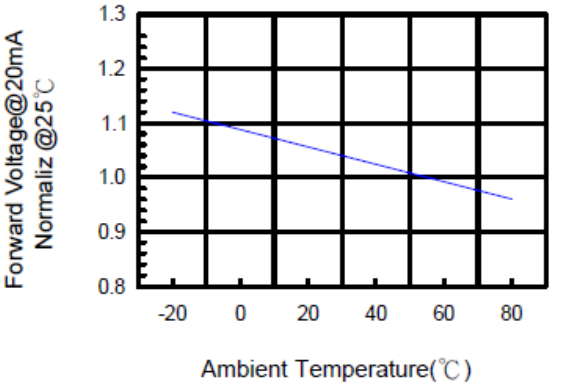


Fig.4 Relative Intensity vs. Temperature

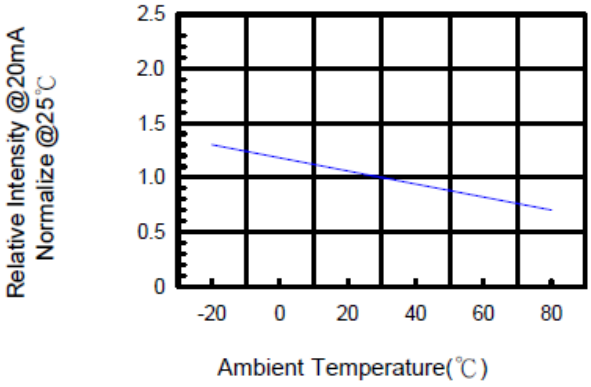


Fig.5 Relative Intensity vs. Wavelength

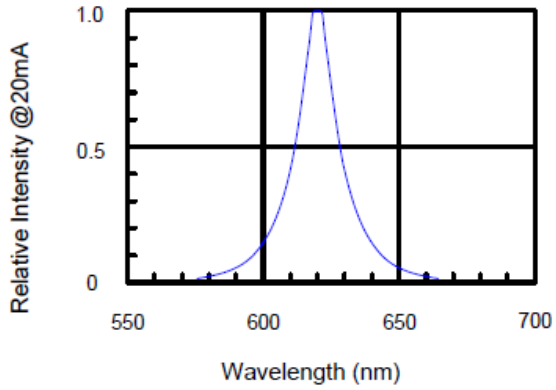
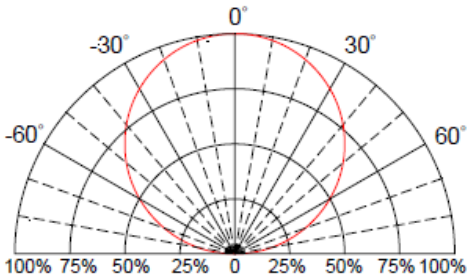


Fig.6 Directive Radiation



TYPICAL ELECTRICAL-OPTICAL CHARACTERISTIC CURVES (GREEN)

Fig.1 Forward current vs. Forward Voltage

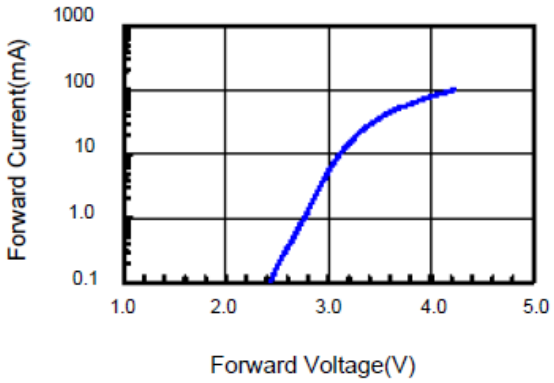


Fig.2 Relative Intensity vs. Forward Current

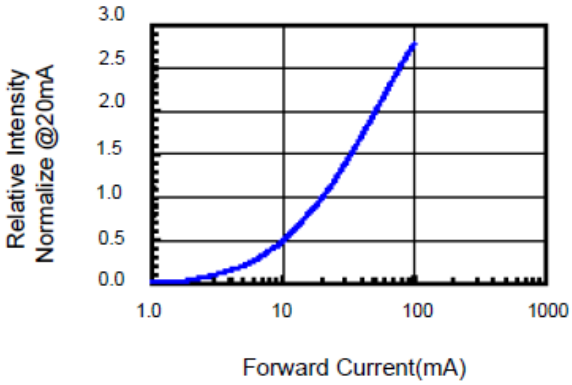


Fig.3 Forward Voltage vs. Temperature

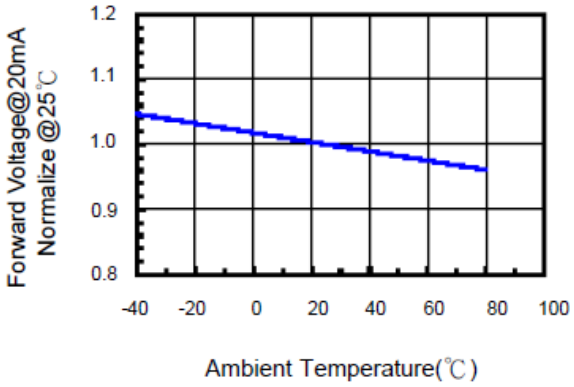


Fig.4 Relative Intensity vs. Temperature

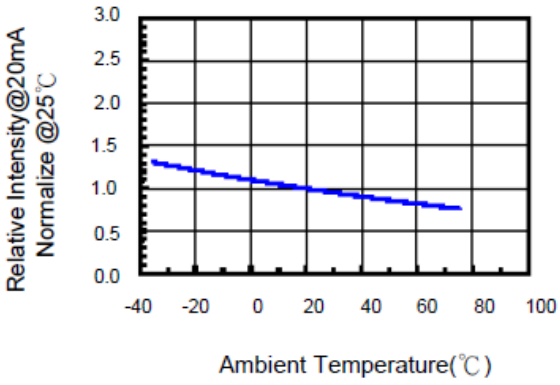


Fig.5 Relative Intensity vs. Wavelength

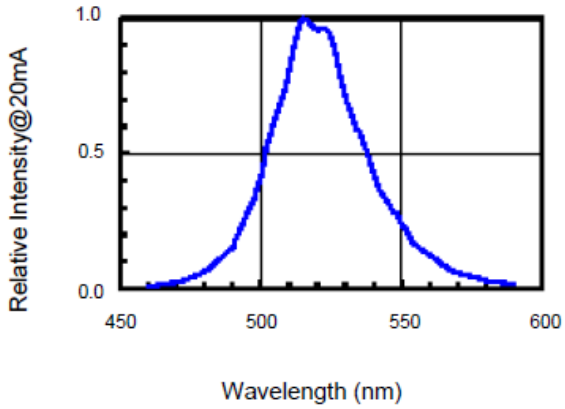
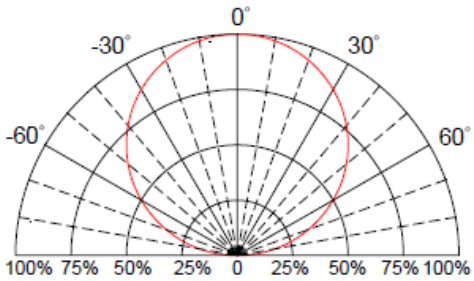


Fig.6 Directive Radiation



TYPICAL ELECTRICAL-OPTICAL CHARACTERISTIC CURVES (BLUE)

Fig.1 Forward current vs. Forward Voltage

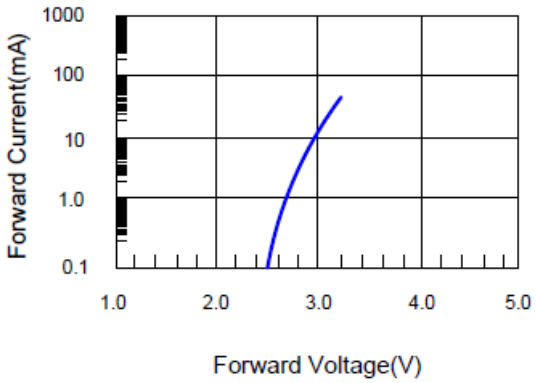


Fig.2 Relative Intensity vs. Forward Current

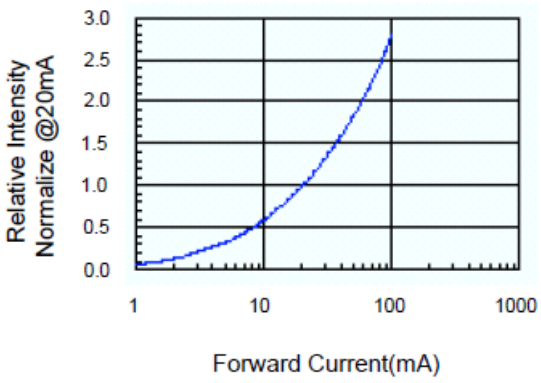


Fig.3 Forward Voltage vs. Temperature

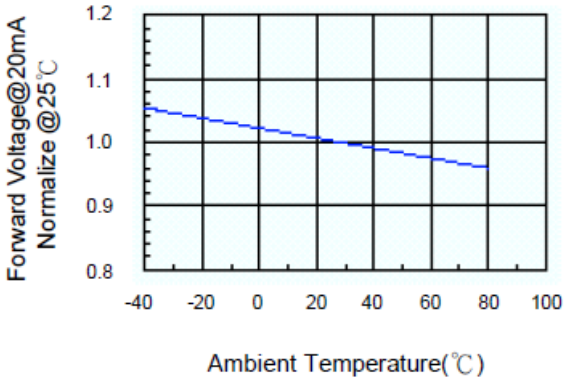


Fig.4 Relative Intensity vs. Temperature

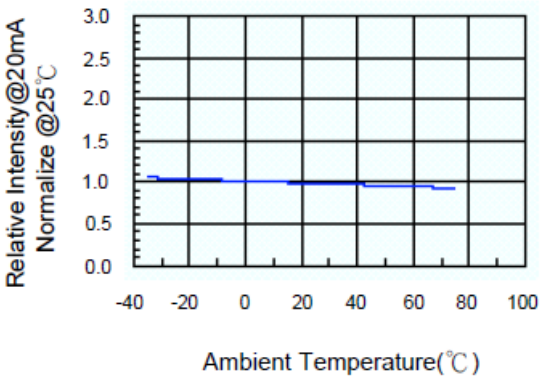


Fig.5 Relative Intensity vs. Wavelength

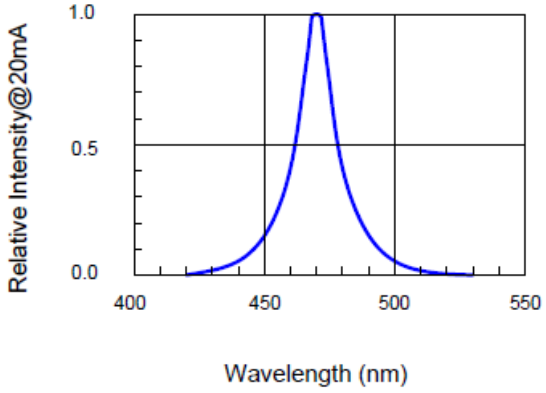
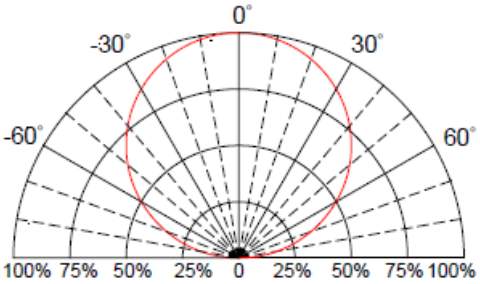
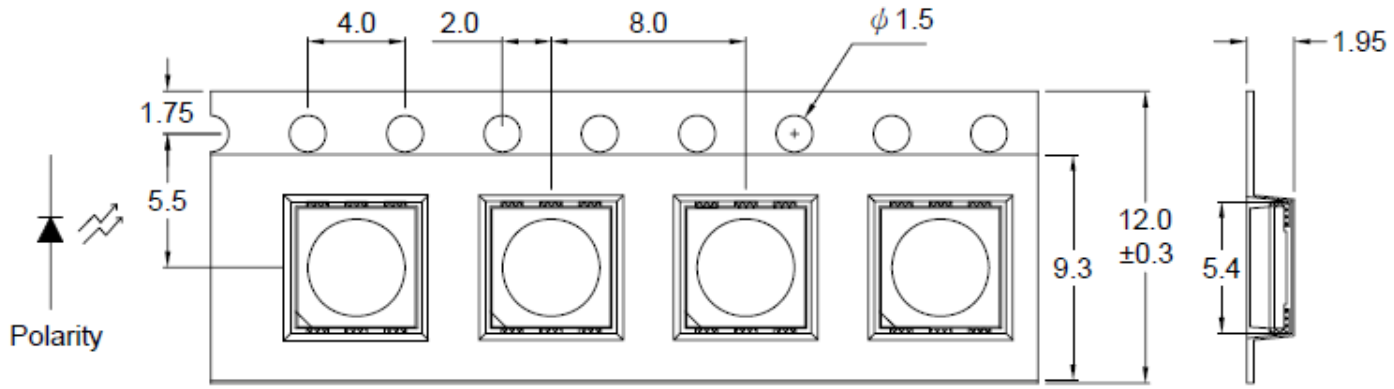


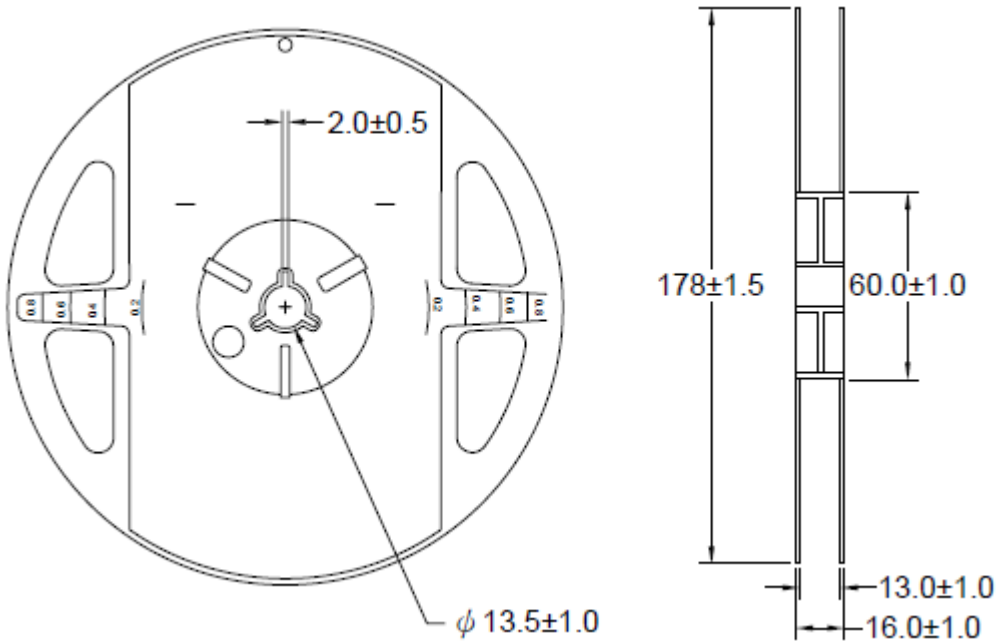
Fig.6 Directive Radiation



CARRIER TAPE DIMENSIONS



REEL DIMENSION

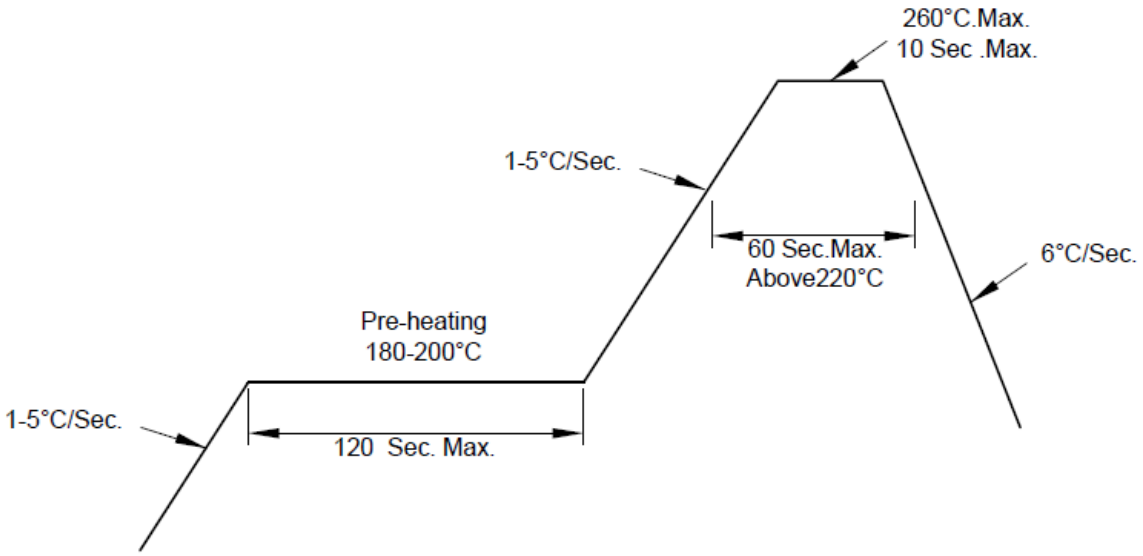


Notes:
1. 12.0mm tape, 7” Reel; 1,000 pcs/reel
2. Tolerance unless mentioned is ±0.2mm

SOLDERING CONDITIONS

Pb-Free solder temperature profile

Pb -free solder Temperature profile	
Pre-heat	180-200°C
Pre-heat time	120 Sec Max
Peak-Temperature	260°C Max
Soldering time condition	10 Sec Max



- Repairing should not be done after the LEDs have been soldered. When repairing is unavoidable, a double-head soldering iron should be used. It should be confirmed beforehand whether the Characteristics of the LEDs will or will not be damaged by repairing.
- Reflow soldering should not be done more than two times.
- When soldering, do not put stress on the LEDs during heating.
- After soldering, do not warp the circuit board.

RELIABILITY TEST

Classification	Test Item	Test Condition	Sample Size
Endurance Test	Operating Life Test	1.Ta=Under Room Temperature As Per Data Sheet Maximum Rating. 2.If=150mA 3.t=1000 hrs	22
	High Temperature Storage Test	1.Ta=105℃±5℃ 2.t=500 hrs	22
	Low Temperature Storage Test	1.Ta=-40℃±5℃ 2.t=1000 hrs	22
	High Temperature High Humidity Storage Test	1.IR-Reflow In-Board, 2 Times 2.Ta=85℃±5℃ 3.RH=90%~95% 4.t=500hrs±2hrs	22
Environmental Test	Thermal Shock Test	1.IR-Reflow In-Board,2 times 2.Ta=105℃±5℃ & -40℃±5℃ (30min) (30min) 3.total 100 cycles	22
	Reflow Soldering Test	1.T.Sol=260℃±5℃ 2.Dwell Time= 10Max.	22
	Temperature Cycling	1.105℃ ~ 25℃ ~ -40℃ 30mins 15mins 30mins 2.100 Cyeles	22

(2)Criteria for judging the damage

Item	Symbol	Test Conditions	Criteria for Judgement	
			Min.	Max.
Forward Voltage	Vf	If=150mA	-	U.S.L x1.2
Reverse Current	Ir	Vr=5V	-	U.S.L x2.0
Luminous Intensity	Iv	If=150mA	L.S.L x 0.7	-