



ATTENTION
OBSERVE PRECAUTIONS
FOR HANDLING
ELECTROSTATIC
DISCHARGE
SENSITIVE
DEVICES

Part Number: APTB1612SURKQWDF-AMT

Hyper Red
White

Description

The Hyper Red source color devices are made with AlGaInP on GaAs substrate Light Emitting Diode.

The source color devices are made with InGaN Light Emitting Diode.

Static electricity and surge damage the LEDs.

It is recommended to use a wrist band or anti-electrostatic glove when handling the LEDs.

All devices, equipment and machinery must be electrically grounded.

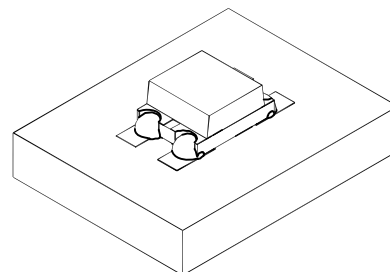
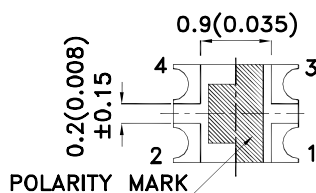
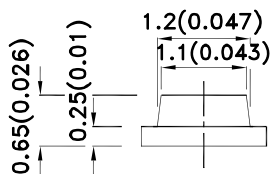
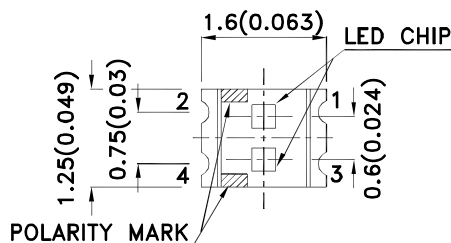
Features

- High reliability LED package.
- 1.6mmx1.25mm SMT LED, 0.65mm thickness.
- Bi-color, low power consumption.
- Wide viewing angle.
- Ideal for backlight and indicator.
- Various colors and lens types available.
- Package : 2000pcs / reel.
- Moisture sensitivity level : level 3.
- RoHS compliant.

Applications

- Traffic signaling.
- Backlighting (illuminated advertising , general lighting).
- Interior and exterior automotive lighting.
- Substitution of micro incandescent lamps.
- Reading lamps.
- Signal and symbol luminaire for orientation.
- Marker lights (e.g. Steps, exit ways, etc).
- Decorative and entertainment lighting.
- Indoor and outdoor commercial and residential architectural lighting.

Package Dimensions



Notes:

1. All dimensions are in millimeters (inches).
2. Tolerance is $\pm 0.2(0.008)$ unless otherwise noted.
3. The specifications, characteristics and technical data described in the datasheet are subject to change without prior notice.
4. The device has a single mounting surface. The device must be mounted according to the specifications.



Selection Guide

Part No.	Dice	Lens Type	Iv (mcd) [1] @ 20mA			Viewing Angle [1]
			Code.	Min.	Max.	2θ1/2
APT61612SURKQWDF-AMT	Hyper Red (AlGaInP)	Yellow Fluorescent	N	120	200	120°
			P	200	300	
			Q	300	400	
	White (InGaN)		N	120	200	
			P	200	300	
			Q	300	400	

Notes:

1. θ1/2 is the angle from optical centerline where the luminous intensity is 1/2 of the optical peak value.
2. Luminous intensity/ luminous Flux: +/-15%.

Absolute Maximum Ratings at TA=25°C

Parameter	Symbol	Value		Unit	
		Hyper Red	White		
Power dissipation	P _D	75	80	mW	
Operating Temperature	T _{op}	-40 To+ 100		°C	
Storage Temperature	T _{stg}	-40 To+ 110		°C	
Junction temperature	T _J	120	110	°C	
DC Forward Current (TA=25°C)	I _F	30	20	mA	
Peak Forward Current [1] (TA=25°C)	I _{FM}	185	150	mA	
Reverse Voltage (TA=25°C)	V _R	5	5	V	
Electrostatic Discharge Threshold (HBM)		3000	250	V	
Thermal resistance (Junction/solder point)	1 chip on (typ.) 2 chip on (typ.) 1 chip on (max.) 2 chip on (max.)	R _{th j-s} R _{th j-s} R _{th j-s} [2] R _{th j-s} [2]	220 540 256 710	220 330 256 410	°C/W

Note:

1. 1/10 Duty Cycle, 0.1ms Pulse Width.
2. R_{th}(max) is based on statistic values.

Electrical / Optical Characteristics at TA=25°C [Red]

Parameter	Symbol	Value			Unit
		Min.	Typ.	Max.	
Wavelength at peak emission I _F =20mA	λ _{peak}		650		nm
Dominant Wavelength I _F =20mA	λ _{dom} [1]	620		640	nm
Spectral bandwidth at 50%Φ _{REL MAX} I _F =20mA	Δλ		28		nm
Forward Voltage I _F =20mA	V _F [2]		1.95	2.5	V
Reverse Current (V _R = 5V)	I _R			10	uA
Temperature coefficient of λ _{peak} I _F =20mA, -10 ° C ≤ T ≤ 100 ° C	TC _{λ peak}		0.14		nm/° C
Temperature coefficient of λ _{dom} I _F =20mA, -10 ° C ≤ T ≤ 100 ° C	TC _{λ dom}		0.08		nm/° C
Temperature coefficient of V _F I _F =20mA, -10 ° C ≤ T ≤ 100 ° C	TC _V		-3.0		mV/° C

Notes:

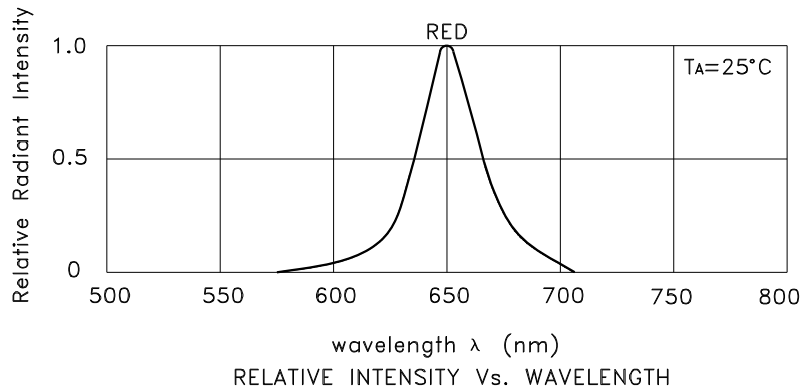
1. The dominant Wavelength (λ_d) above is the setup value of the sorting machine. (Tolerance λ_d : ±1nm.)
2. Forward Voltage: +/-0.1V.

Electrical / Optical Characteristics at TA=25°C [White]

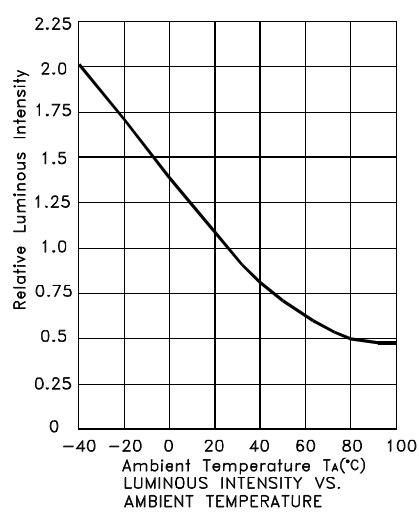
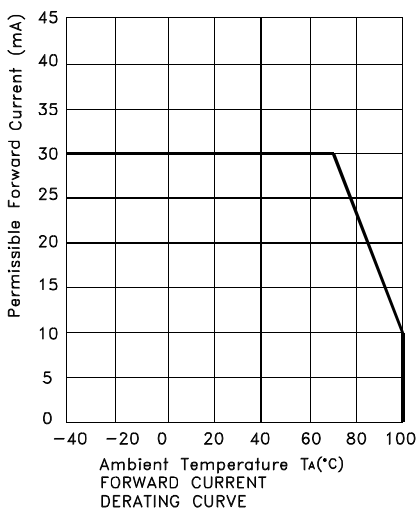
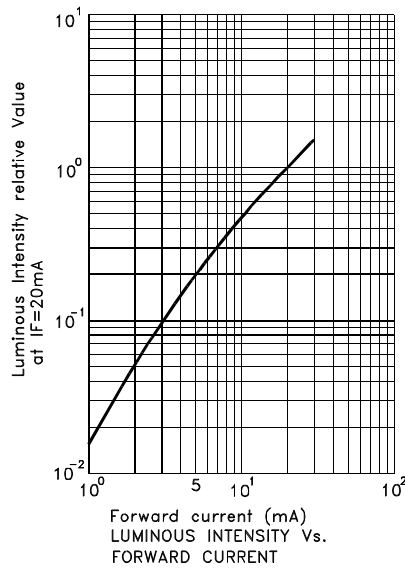
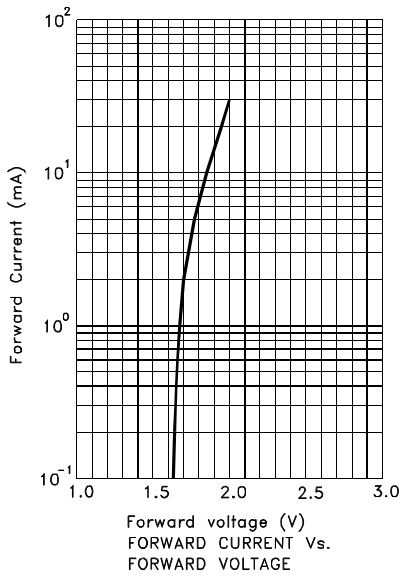
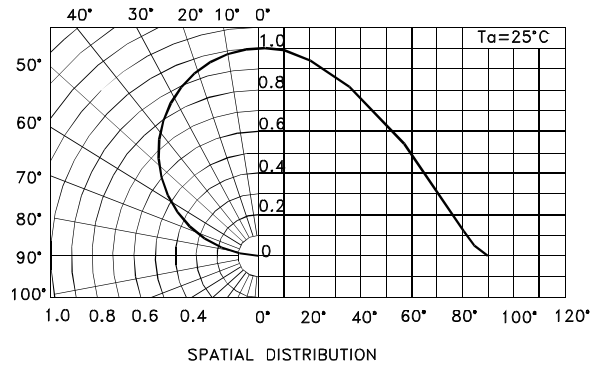
Parameter	Symbol	Value	Unit
Chromaticity coordinate x acc.to CIE1931 IF=20mA [Typ.]	x [1]	0.31	
Chromaticity coordinate y acc.to CIE1931 IF=20mA [Typ.]	y [1]	0.31	
Reverse Current (VR = 5V) [Max.]	IR	50	uA
Forward Voltage IF=20mA [Min.]	VF [2]	-	V
Forward Voltage IF=20mA [Typ.]		3.3	
Forward Voltage IF=20mA [Max.]		4.0	
Temperature coefficient of VF IF=20mA, -10 ° C ≤ T ≤ 100 ° C [Typ.]	TCv	-2.5	mV/° C
Temperature coefficient of x IF=20mA, -10 ° C ≤ T ≤ 100 ° C [Typ.]	TCx	-0.1	10 ⁻³ /° C
Temperature coefficient of y IF=20mA, -10 ° C ≤ T ≤ 100 ° C [Typ.]	TCy	-0.2	10 ⁻³ /° C

Notes:

- 1.Measurement tolerance of the chromaticity coordinates is ±0.01.
- 2.Forward Voltage: +/-0.1V.

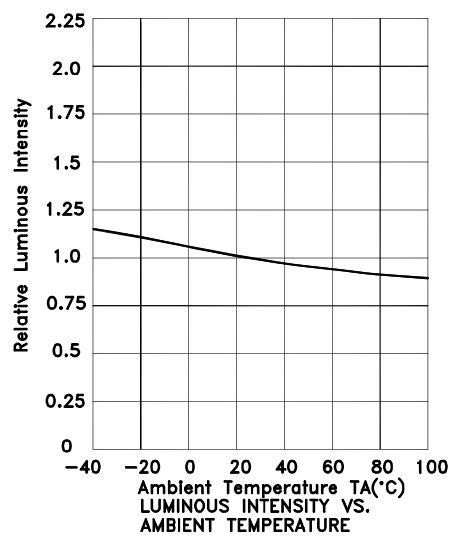
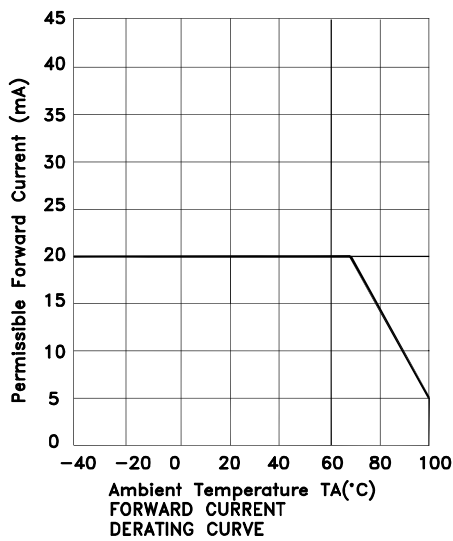
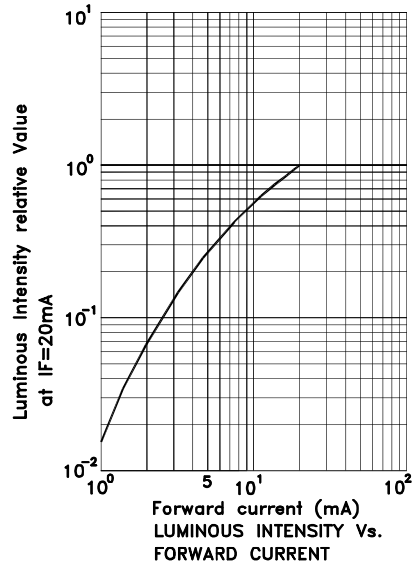
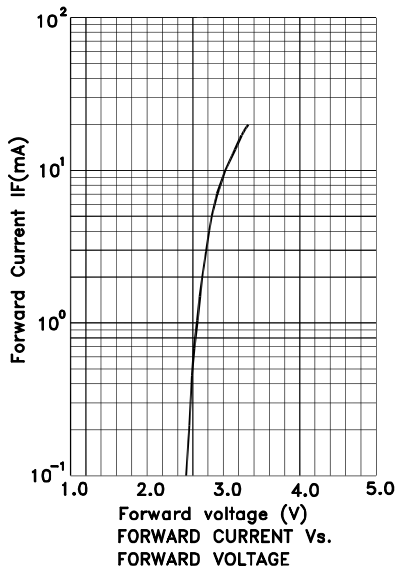
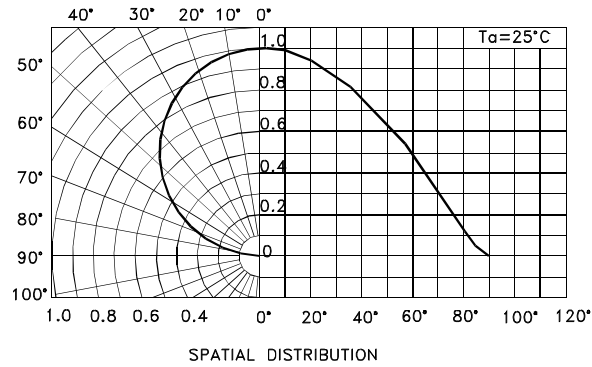


Hyper Red



Kingbright

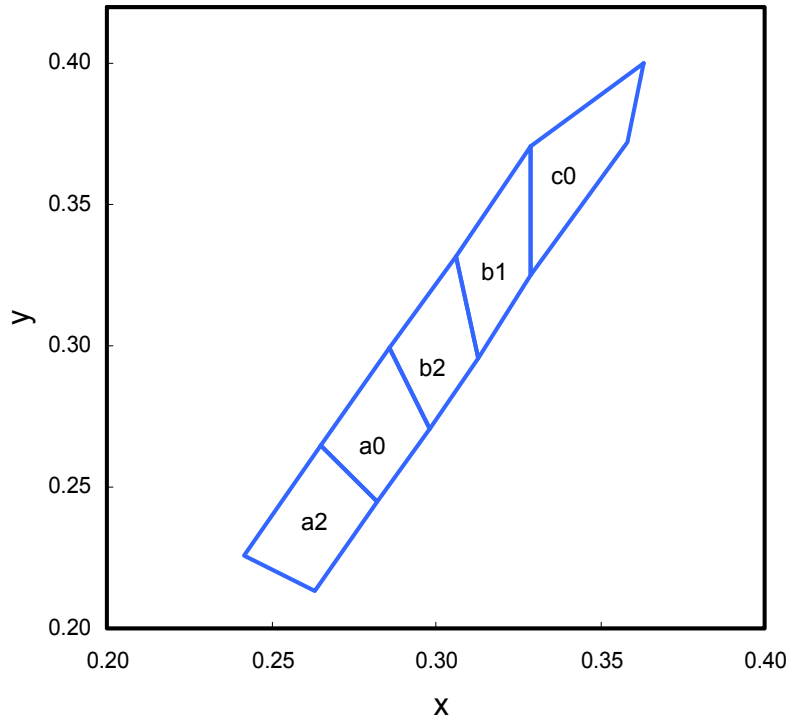
White



White

APT B1612SURKQWDF-AMT

White CIE



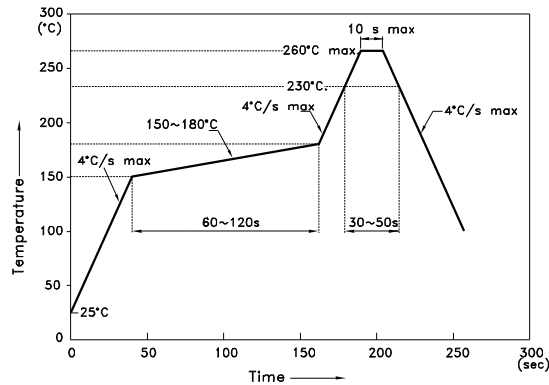
	x	y		x	y		x	y
a2	0.263	0.213	a0	0.282	0.245	b2	0.298	0.271
	0.282	0.245		0.298	0.271		0.313	0.296
	0.265	0.265		0.286	0.299		0.306	0.332
	0.242	0.226		0.265	0.265		0.286	0.299
b1	0.313	0.296	c0	0.329	0.325			
	0.329	0.325		0.358	0.372			
	0.329	0.371		0.363	0.400			
	0.306	0.332		0.329	0.371			

Notes:
 Shipment may contain more than one chromaticity regions.
 Orders for single chromaticity region are generally not accepted.
 Measurement tolerance of the chromaticity coordinates is ± 0.01 .

APTB1612SURKQWDF-AMT

Reflow soldering is recommended and the soldering profile is shown below.
Other soldering methods are not recommended as they might cause damage to the product.

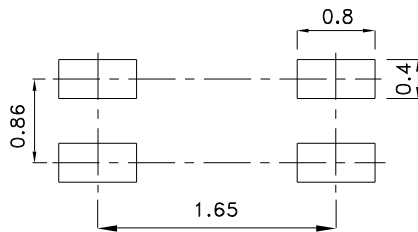
Reflow Soldering Profile For Lead-free SMT Process.



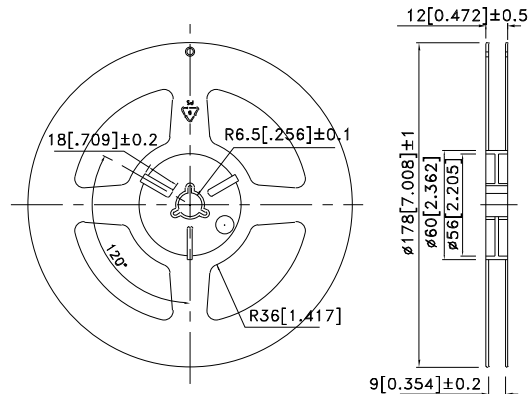
NOTES:

1. We recommend the reflow temperature 245°C(+/-5°C). The maximum soldering temperature should be limited to 260°C.
2. Don't cause stress to the epoxy resin while it is exposed to high temperature.
3. Number of reflow process shall be 2 times or less.

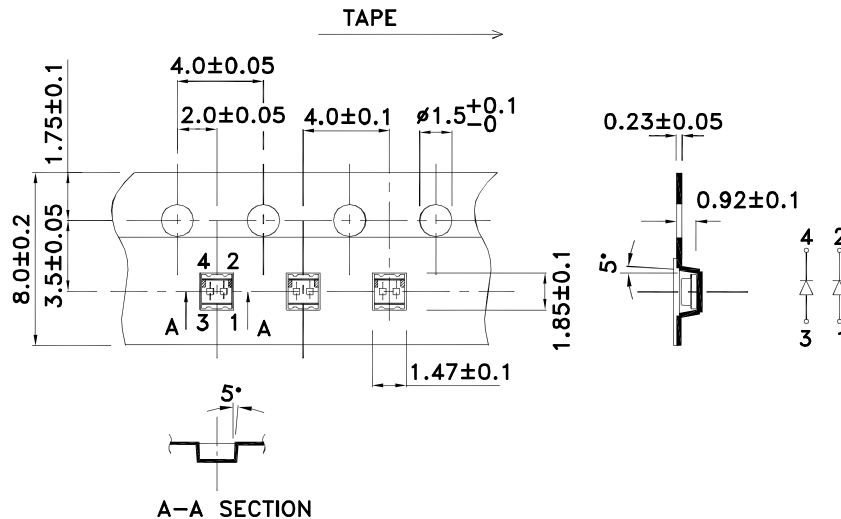
Recommended Soldering Pattern (Units : mm; Tolerance: ± 0.1)



Reel Dimension

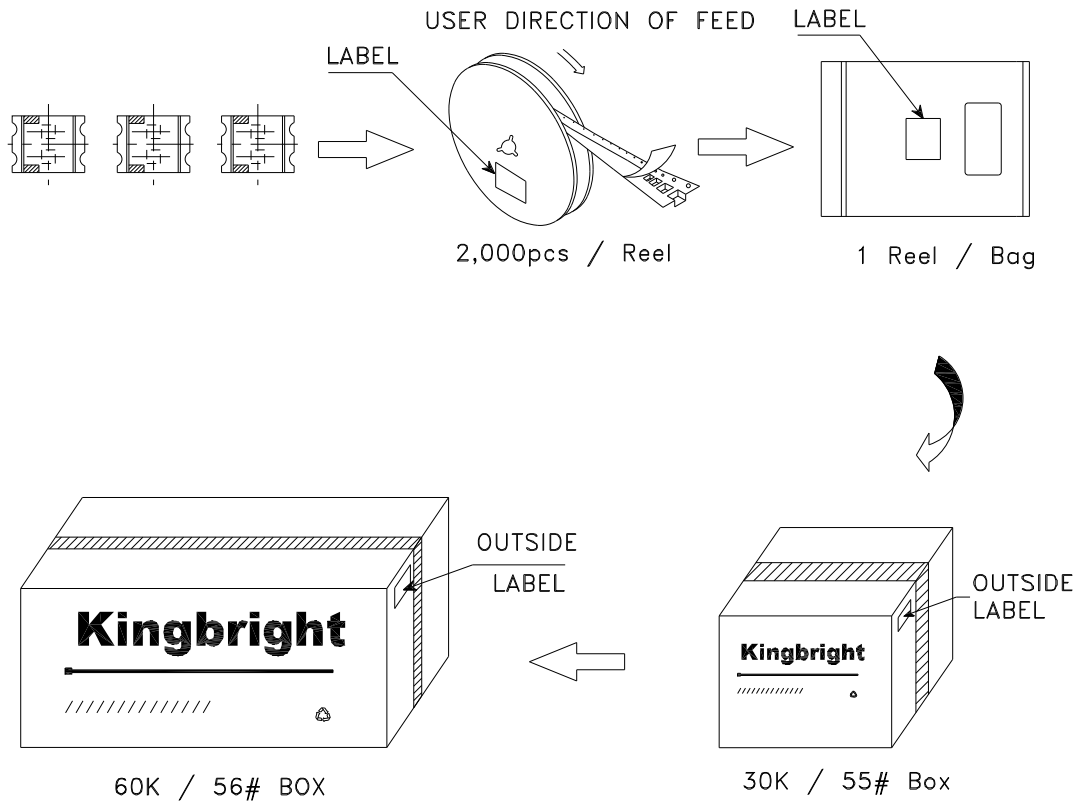



Tape Dimensions (Units : mm)



PACKING & LABEL SPECIFICATIONS

APTB1612SURKQWDF-AMT



<h1>Kingbright</h1>	
P/NO: APTB1612xxx	
QTY: 2,000 pcs	Q.C. Q C xx xx xxxx PASSED
S/N: XXXX	
CODE: XXX	
LOT NO:	
 xxxxxxxxxxxxxxxxxxxxxxxxxxxx	
RoHS Compliant	

Reliability Test Items And Conditions

The reliability of products shall be satisfied with items listed below

Lot Tolerance Percent Defective (LTPD) : 10%

No.	Test Item	Standards	Test Condition	Test Times / Cycles	Number of Damaged
1	Continuous operating test	-	Ta = 25°C ,IF = maximum rated current*	1,000 h	0 / 22
2	High Temp. operating test	EIAJ ED-4701/100(101)	Ta = 100°C IF = maximum rated current*	1,000 h	0 / 22
3	Low Temp. operating test	-	Ta = -40°C, IF = maximum rated current*	1,000 h	0 / 22
4	High temp. storage test	EIAJ ED-4701/100(201)	Ta = maximum rated storage temperature	1,000 h	0 / 22
5	Low temp. storage test	EIAJ ED-4701/100(202)	Ta = -40°C	1,000 h	0 / 22
6	High temp. & humidity storage test	EIAJ ED-4701/100(103)	Ta = 60°C, RH = 90%	1,000 h	0 / 22
7	High temp. & humidity operating test	EIAJ ED-4701/100(102)	Ta = 60°C, RH = 90% IF = maximum rated current*	1,000 h	0 / 22
8	Soldering reliability test	EIAJ ED-4701/100(301)	Moisture soak : 30°C,70% RH, 72h Preheat : 150~180°C(120s max.) Soldering temp : 260°C(10s)	3 times	0 / 18
9	Thermal shock operating test	-	Ta = -40°C(15min) ~ 100°C(15min) IF = derated current at 100°C	1,000 cycles	0 / 22
10	Thermal shock test	-	Ta = -40°C(15min) ~ maximum rated storage temperature(15min)	1,000 cycles	0 / 22
11	Electric Static Discharge (ESD)	EIAJ ED-4701/100(304)	C = 100pF , R2 = 1.5KΩ V = 3000V(Red) V=250V(White)	Once each Polarity	0 / 22
12	Vibration test	-	a = 196m/s ² , f = 100~2KHz , t = 48min for all xyz axes	4 times	0 / 22

* : Refer to forward current vs. derating curve diagram

Failure Criteria

Items	Symbols	Conditions	Failure Criteria
luminous Intensity	Iv	IF = 20mA	Testing Min. Value < Spec.Min.Value x 0.5
Forward Voltage	Vf	IF = 20mA	Testing Max. Value ≥ Spec.Max.Value x 1.2
Reverse Current	IR	VR = Maximum Rated Reverse Voltage	Testing Max. Value ≥ Spec.Max.Value x 2.5
High temp. storage test	-	-	Occurrence of notable decoloration, deformation and cracking