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LED Product Spec

PT56Axx

MODEL NAME: PT56Axx

<◆> Preliminary Specification

< > Final Specification

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Record of Revision

Version and Date	Page	Old description	New Description	Remark
0.1 2010/09/07	All	First Preliminary Edition		

Preliminary

1 Specification

1.1 Absolute Maximum Ratings (Ta=25°C)

Item	Symbol	Absolute Maximum Rating	Unit
Forward Current	I _F	180	mA
Pulse Forward Current *1	I _{FP}	300	mA
Reverse Voltage	V _R	5	V
Power Dissipation	P _D	0.5	W
Operating Temperature	T _{opr}	-30 ~ + 85	°C
Storage Temperature	T _{stg}	-40 ~ +100	°C
Soldering Temperature	T _{slid}	Reflow Soldering : 245 (10sec) Hand Soldering : 350 (3sec)	°C

*1: I_{FP} Condition: Duty 1/10, Pulse within 10msec.

1.2 Initial Electrical/Optical Characteristics (Ta=25°C)

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Forward Voltage	V _F	I _F =120 mA	2.9		3.5	V
Luminous Flux	Φ _v	I _F =120 mA	18.5		33.5	lm
View Angle	2θ _{1/2}	I _F =120 mA	-	120	-	degree
Chromaticity Coordinate *1	x	I _F =120 mA	Refer to ranking table			-
	y	I _F =120 mA				

*1 Please refer to CIE 1931 chromaticity diagram

1.3 Ranking

1.3.1 Luminous Flux Ranks (Ta=25°C)

Item	Symbol	Condition	Min.	Max.	Unit
A	Φ _v	I _F =120 mA	18.5	21.5	Lm
B	Φ _v	I _F =120 mA	21.5	24.5	
C	Φ _v	I _F =120 mA	24.5	27.5	
D	Φ _v	I _F =120 mA	27.5	30.5	
E	Φ _v	I _F =120 mA	30.5	33.5	

*Luminous Flux Measurement allowance is ±7%

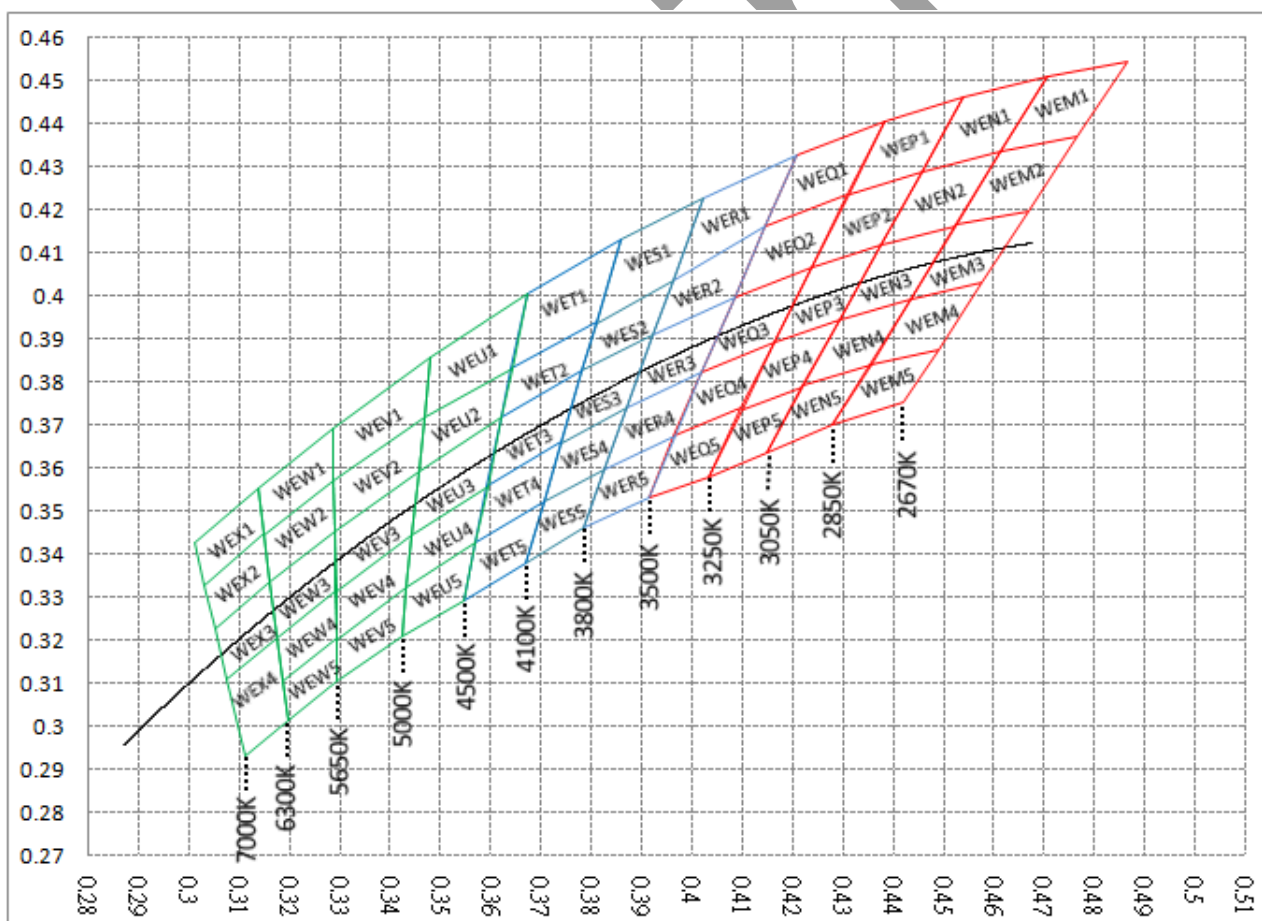
1.3.2 Forward Voltage Ranks (Ta=25°C)

Item	Symbol	Condition	Min.	Max.	Unit
1	V _F	I _F =120 mA	2.9	3.0	V
2	V _F	I _F =120 mA	3.0	3.1	V
3	V _F	I _F =120 mA	3.1	3.2	V
4	V _F	I _F =120 mA	3.2	3.3	V
5	V _F	I _F =120 mA	3.3	3.4	V
6	V _F	I _F =120 mA	3.4	3.5	V

* Forward Voltage Measurement allowance is ±3%

1.3.3 Color Rank (I_F=120mA, Ta=25°C)

Chromaticity Diagram



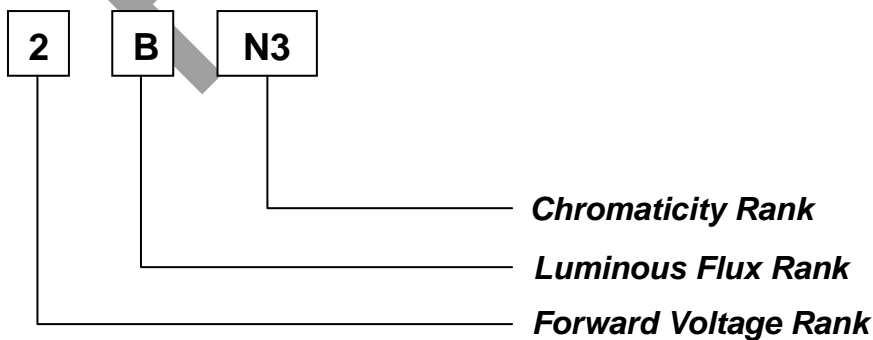
* Color Coordinates Measurement allowance is ±0.007

WEM1		WEN1		WEP1		WEQ1	
0.4866	0.4542	0.4705	0.4508	0.4538	0.446	0.4385	0.4404
0.4767	0.4366	0.4614	0.4333	0.4456	0.4287	0.4312	0.4234
0.4614	0.4333	0.4456	0.4287	0.4312	0.4234	0.4148	0.4161
0.4705	0.4508	0.4538	0.446	0.4385	0.4404	0.4209	0.4326
WEM2		WEN2		WEP2		WEQ2	
0.4767	0.4366	0.4614	0.4333	0.4456	0.4287	0.4312	0.4234
0.4671	0.4196	0.4525	0.4162	0.4376	0.4116	0.424	0.4065
0.4525	0.4162	0.4376	0.4116	0.424	0.4065	0.4086	0.3995
0.4614	0.4333	0.4456	0.4287	0.4312	0.4234	0.4148	0.4161
WEM3		WEN3		WEP3		WEQ3	
0.4671	0.4196	0.4525	0.4162	0.4376	0.4116	0.424	0.4065
0.4577	0.4029	0.4436	0.3991	0.4294	0.3943	0.4165	0.389
0.4436	0.3991	0.4294	0.3943	0.4165	0.389	0.4021	0.3822
0.4525	0.4162	0.4376	0.4116	0.424	0.4065	0.4086	0.3995
WEM4		WEN4		WEP4		WEQ4	
0.4436	0.3991	0.4294	0.3943	0.4165	0.389	0.4021	0.3822
0.4577	0.4029	0.4436	0.3991	0.4294	0.3943	0.4165	0.389
0.449	0.3875	0.4356	0.3837	0.4221	0.379	0.41	0.3738
0.4356	0.3837	0.4221	0.379	0.41	0.3738	0.3966	0.3673
WEM5		WEN5		WEP5		WEQ5	
0.4356	0.3837	0.4221	0.379	0.41	0.3738	0.3966	0.3673
0.449	0.3875	0.4356	0.3837	0.4221	0.379	0.41	0.3738
0.442	0.375	0.428	0.37	0.415	0.3635	0.4035	0.358
0.428	0.37	0.415	0.3635	0.4035	0.358	0.3917	0.353

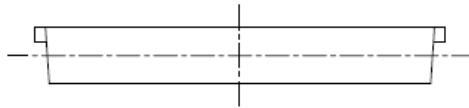
WER1		WES1		WET1		WEU1	
0.4023	0.4228	0.386	0.413	0.3673	0.4003	0.3481	0.3856
0.4209	0.4326	0.4023	0.4228	0.386	0.413	0.3673	0.4003
0.4148	0.4161	0.3963	0.4035	0.3811	0.3937	0.3642	0.3829
0.3963	0.4035	0.3811	0.3937	0.3642	0.3829	0.3469	0.3717
WER2		WES2		WET2		WEU2	
0.3963	0.4035	0.3811	0.3937	0.3642	0.3829	0.3469	0.3717
0.4148	0.4161	0.3963	0.4035	0.3811	0.3937	0.3642	0.3829
0.4086	0.3995	0.3924	0.3909	0.3783	0.3825	0.3622	0.3716
0.3924	0.3909	0.3783	0.3825	0.3622	0.3716	0.3458	0.3592
WER3		WES3		WET3		WEU3	
0.3924	0.3909	0.3783	0.3825	0.3622	0.3716	0.3458	0.3592
0.4086	0.3995	0.3924	0.3909	0.3783	0.3825	0.3622	0.3716
0.4021	0.3822	0.3871	0.3739	0.3741	0.3658	0.3594	0.3557
0.3871	0.3739	0.3741	0.3658	0.3594	0.3557	0.3444	0.3442
WER4		WES4		WET4		WEU4	
0.3871	0.3739	0.3741	0.3658	0.3594	0.3557	0.3444	0.3442
0.4021	0.3822	0.3871	0.3739	0.3741	0.3658	0.3594	0.3557
0.3966	0.3673	0.3826	0.3595	0.3706	0.352	0.3571	0.3426
0.3826	0.3595	0.3706	0.352	0.3571	0.3426	0.3434	0.332
WER5		WES5		WET5		WEU5	
0.3826	0.3595	0.3706	0.352	0.3571	0.3426	0.3434	0.332
0.3966	0.3673	0.3826	0.3595	0.3706	0.352	0.3571	0.3426
0.3917	0.353	0.3785	0.346	0.367	0.3377	0.3548	0.329
0.3785	0.346	0.367	0.3377	0.3548	0.329	0.3425	0.3208

WEV1		WEW1		WEX1	
0.3286	0.369	0.3136	0.355	0.3011	0.3422
0.3481	0.3856	0.3286	0.369	0.3136	0.355
0.3469	0.3717	0.3288	0.3569	0.3148	0.3444
0.3288	0.3569	0.3148	0.3444	0.3031	0.3327
WEV2		WEW2		WEX2	
0.3288	0.3569	0.3148	0.3444	0.3031	0.3327
0.3469	0.3717	0.3288	0.3569	0.3148	0.3444
0.3458	0.3592	0.329	0.3451	0.316	0.3332
0.329	0.3451	0.316	0.3332	0.3052	0.3224
WEV3		WEW3		WEX3	
0.329	0.3451	0.316	0.3332	0.3052	0.3224
0.3458	0.3592	0.329	0.3451	0.316	0.3332
0.3444	0.3442	0.3292	0.3313	0.3175	0.3204
0.3292	0.3313	0.3175	0.3204	0.3076	0.3108
WEV4		WEW4		WEX4	
0.3292	0.3313	0.3175	0.3204	0.3076	0.3108
0.3444	0.3442	0.3292	0.3313	0.3175	0.3204
0.3434	0.332	0.3294	0.3202	0.3196	0.3013
0.3294	0.3202	0.3186	0.3102	0.3112	0.2932
WEV5		WEW5			
0.3294	0.3202	0.3186	0.3102		
0.3434	0.332	0.3294	0.3202		
0.3425	0.3208	0.3295	0.3105		
0.3295	0.3105	0.3196	0.3013		

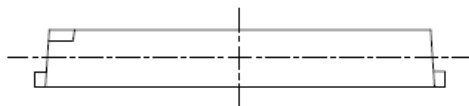
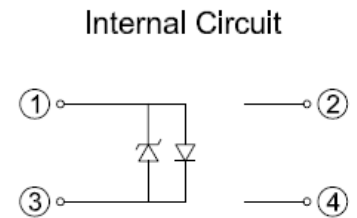
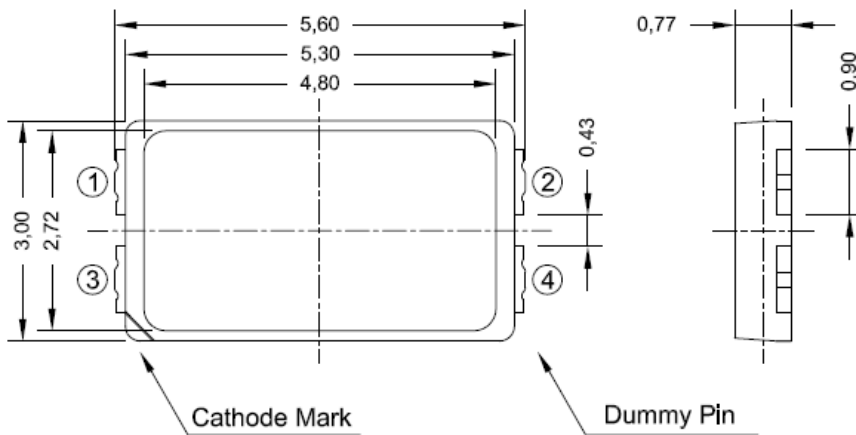
Bin code definition



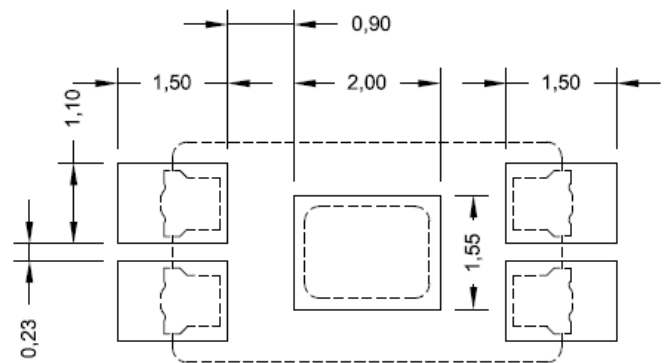
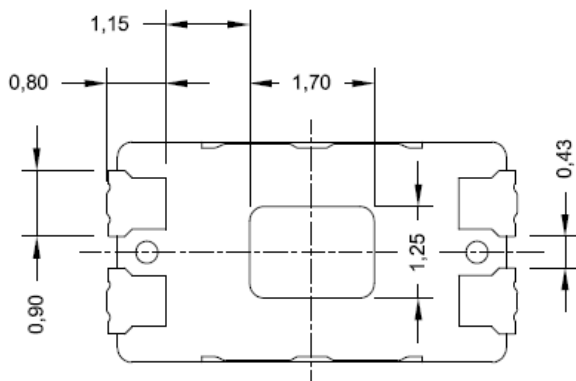
2 Outline Dimension and Recommended Soldering Pad



Unit : mm
Tolerance : ± 0.1



Recommended Soldering Pad Design



3 Reliability

3.1 Test Items and Results

No	Item	Condition	Time/Cycle	Number of Damaged
1.	<i>Soldering Heat Test</i>	260°C ± 5 °C	10 sec	0/60
2	<i>Thermal Shock</i>	0 °C(15 sec) ~ 100 °C(15 sec)	20 cycle	0/60
3	<i>High Temp. Storage</i>	100 °C	1000 Hrs	0/60
4	<i>Low Temp. Storage</i>	-40 °C	1000 Hrs	0/60
5	<i>Temperature Cycle Test</i>	-40 °C ~ 80 °C	100 Cycles, 200 Hrs	0/60
6	<i>High Temp. and Humidity Test</i>	60 °C, 90 % RH	1000 Hrs	0/60
7	<i>Operation Life Test 1</i>	Room Temp., 20 mA	1000 Hrs	0/60
8	<i>Operation Life Test 2</i>	Room Temp., 30 mA	500 Hrs	0/60
9	<i>High Temp. Operation Life Test</i>	85 °C, 5mA	1000 Hrs	0/60
10	<i>Low Temp. Operation Life Test</i>	-30 °C, 20mA	1000Hrs	0/60

Judgment Criteria

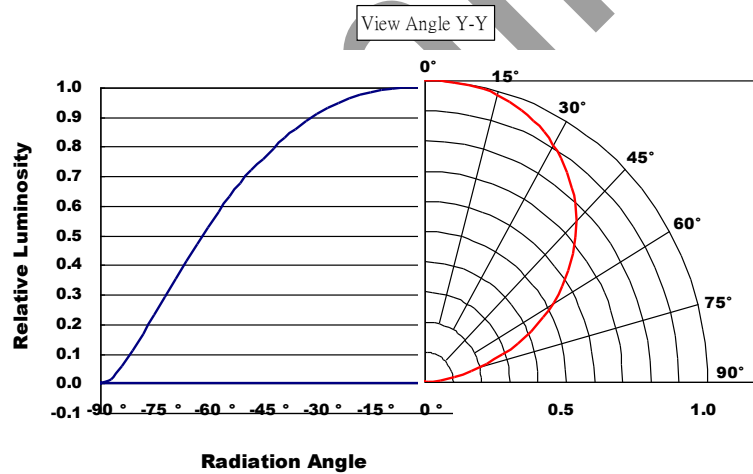
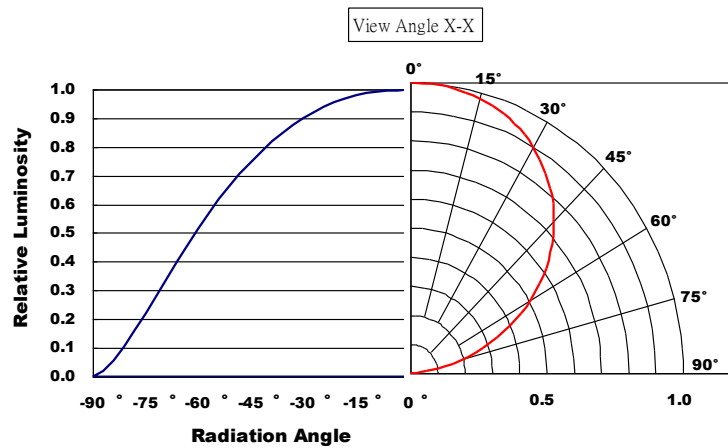
Item	Symbol	Test Conditions	Judgment Criteria
<i>Forward Voltage</i>	V _f	I _F = 20 mA	Δ % < 10 %
<i>Luminous Intensity</i>	I _v	I _F = 20 mA	Δ % < 30 %

4 Initial Optical/Electrical Characteristics

4.1 Spectrum ($I_F = 120\text{mA}$, $T_a = 25^\circ\text{C}$)

TBD

4.2 Directivity



4.3 Forward Voltage vs. Forward Current

$T_a = 25^\circ\text{C}$

TBD

4.4 Forward Current vs. Relative Luminosity

$T_a = 25^\circ\text{C}$

TBD

4.5 Forward Current vs. Chromaticity Coordinate

$T_a = 25^\circ\text{C}$

TBD

4.6 Forward Voltage change vs. Ambient Temperature

$I_F = 120\text{mA}$

4.7 Relative Luminous Intensity vs. Ambient Temperature

$I_F = 120\text{mA}$

(TBD)

4.8 Allowable Forward Current vs. Ambient Temperature**4.9 Chromaticity vs. Ambient Temperature**

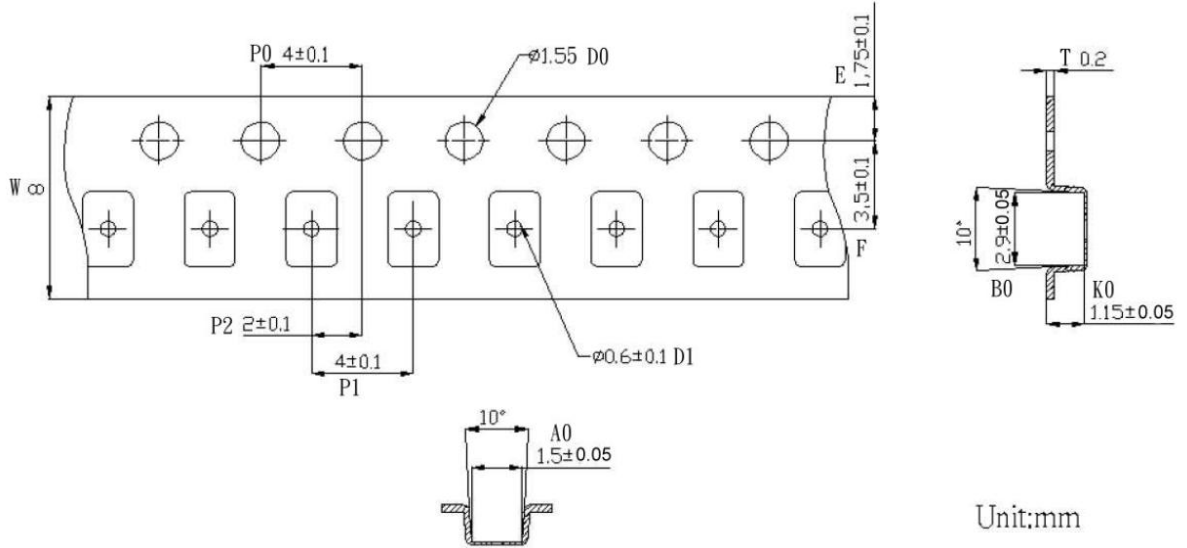
$I_F = 120\text{mA}$

(TBD)

Preliminary

5 Packaging

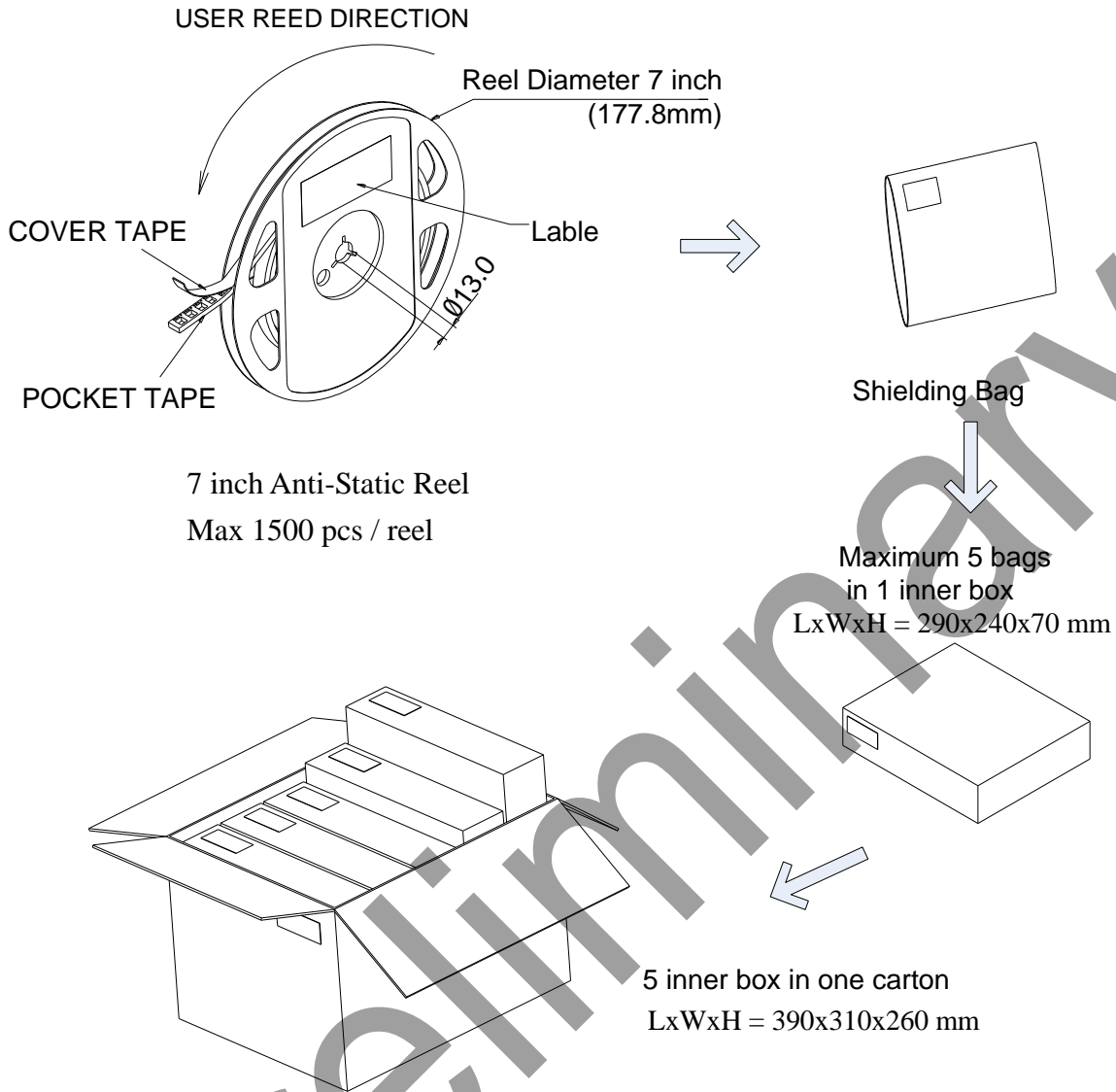
5.1 Carrier Tape Dimension



5.2 Reel Label



5.3 Package



6 Precautions

6.1 Safety Precautions

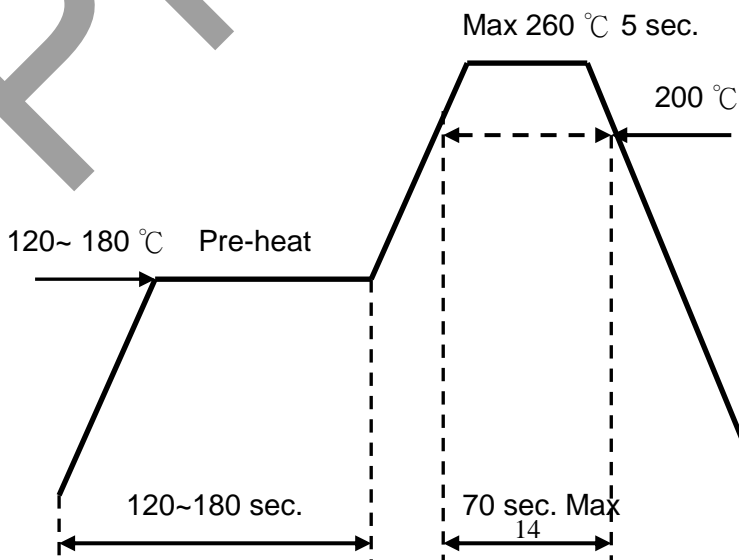
- The LED light output is too strong for human eyes without shield. Prevent eye contact directly more than seconds.
- Ensure operating under maximum rating.

6.2 Storage

- Before opening the package, the LEDs should storage under 30°C, 70% RH. Recommend to use within one year.
- After opening the package bag, the LEDs should be keep under 30°C, 70% RH. Recommend to use within 2days. If unused LEDs remain, suggest to store into moisture proof bag or original package bag with moisture absorbent material such as silica gel. Reseal well is necessary.
- If the product exceeded the storage period or the moisture absorbent material faded away, baking treatment should be done by following conditions.
Baking condition: 60°C, 12hours (One time only).

6.3 Soldering Notice and Conditions

- When soldering LEDs,
- Do not solder/reflow the same LED over two times.
- Recommend soldering conditions:
Hand soldering : 350 °C max , 3 sec. max.
Reflow soldering : Pre-heat 150 °C max , 180 sec. max.
Peak 260 °C max , 5 sec. max.
- Reflow temperature profile as below: (lead-free solder)



- When soldering, don't put stress on the LEDs
- After LEDs have been soldered, strongly recommend not to repair to keep the LEDs performance.

6.4 Static Electricity

- LED package is extremely sensitive to static electricity. It's recommended that anti-electrostatic glove and wrist band is necessary when handling the LEDs. All devices are also be grounded properly as well.
- Protection devices design should be considered in the LED driving circuit.

6.5 Cleaning

- If washing is required, recommend to use alcohol as a solvent.
- Recommend to avoid cleaning the LEDs by ultrasonic. If necessary, pre-test the LED is necessary to confirm whether any damage occur after the process.

Preliminary