



**LED Display**  
**Product Data Sheet**  
LTD-3812SW-P

Spec No. :DS30-2013-0007  
Effective Date: 02/27/2020  
Revision: A

**LITE-ON DCC**

**RELEASE**

**BNS-OD-FC001/A4**

**LED DISPLAY  
LTD-3812SW-P**

**LED DISPLAY**

LTD-3812SW-P (For ELMARC Only)

<u>Rev</u>	<u>Description</u>	<u>By</u>	<u>Date</u>
01	Preliminary Spec.	Eason Lin	07/03/2009
02	Change LED spec.	Eason Lin	07/08/2009
03	Change Operating temperature	Eason Lin	07/14/2009
04	Change LED spec. to Display Spec.	Eason Lin	07/15/2009
05	Change Forward Current Derating Curve	Eason Lin	07/16/2009
06	Add bin code look up table	Eason Lin	08/03/2009
07	Change LED bin code and look up table	Eason Lin	08/10/2009
08	Change LED bin code and look up table	Eason Lin	08/17/2009
09	Change LED P/N: Update look up table	Eason Lin	12/15/2009
10	10.1 Modify LED spec. in page 5~8 10.2 Remove look up table	Reo Lin	01/29/2013
<b>Above data for PD and Customer tracking only</b>			
-	NPPR Received and Upload on System	Reo Lin	02/26/2013
A	Update Packing spec. in page 11	Reo Lin	01/31/2020

## LED DISPLAY LTD-3812SW-P

### 1. Description

The LTD-3812SW-P is a 0.3 inch (7.62 mm) digit height dual digit SMD display. This device uses InGaN white chip LED, which are made from InGaN on a Sapphire substrate. The display has black face and white segments

#### 1.1 Features

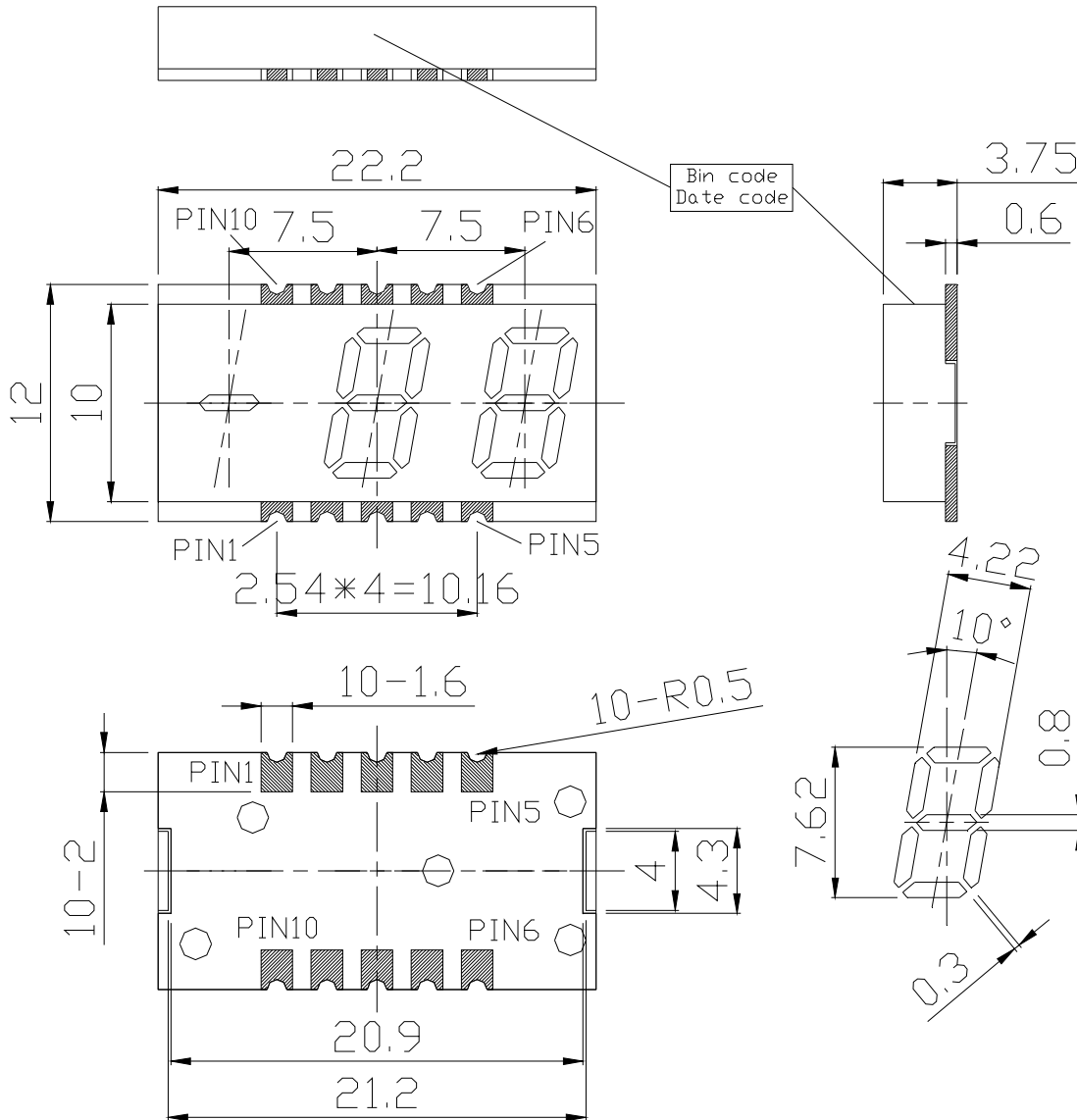
- 0.3 inch (7.62 mm) DIGIT HEIGHT
- CONTINUOUS UNIFORM SEGMENTS
- LOW POWER REQUIREMENT
- EXCELLENT CHARACTERS APPEARANCE
- HIGH BRIGHTNESS & HIGH CONTRAST
- WIDE VIEWING ANGLE
- SOLID STATE RELIABILITY
- CATEGORIZED FOR LUMINOUS INTENSITY.
- LEAD-FREE PACKAGE (ACCORDING TO ROHS)

#### 1.2 Device

Part No	Description
InGaN White	Common Anode
LTD-3812SW-P	

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### 2. Package Dimensions

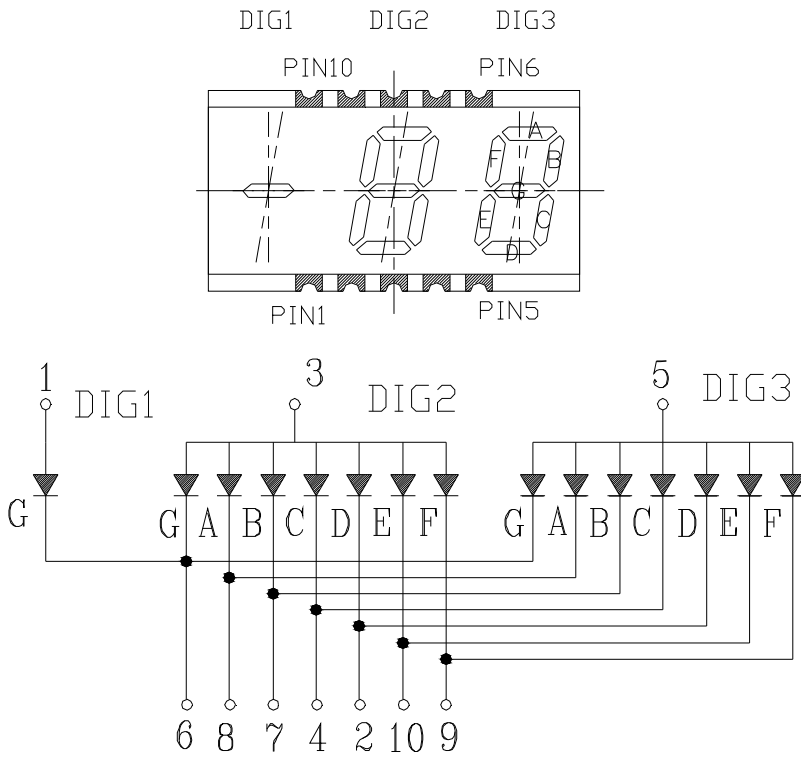


#### Notes :

1. All dimensions are in millimeters. Tolerances are  $\pm 0.25$  mm (0.01") unless otherwise noted
2. Foreign material on segment  $\leq 10$ mil
3. Ink contamination (surface)  $\leq 20$  mils
4. Bubble in segment  $\leq 10$ mil
5. Bending  $\leq 1\%$  of reflector length
6. Plastic pin's burr max is 0.1 mm

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**3. Internal Circuit Diagram**



**4. Pin Connection**

No	Connection
1	COMMON ANODE DIG 1
2	CATHODE D2 & D3
3	COMMON ANODE DIG 2
4	CATHODE C2 & C3
5	COMMON ANODE DIG 3
6	CATHODE G1 G2 & G3
7	CATHODE B2 & B3
8	CATHODE A2 & A3
9	CATHODE F2 & F3
10	CATHODE E2 & E3

## LED DISPLAY LTD-3812SW-P

### 5. Rating and Characteristics

#### 5.1. CHIP LED Absolute Maximum Rating at Ta=25°C

Parameter	Maximum Rating	Unit
Power Dissipation Per Segment	35	mW
Peak Forward Current Per Segment ( 1/10 Duty Cycle, 0.1ms Pulse Width )	50	mA
Continuous Forward Current Per Segment Derating Linear From 25°C Per Segment	10 0.11	mA mA/°C
Operating Temperature Range	-35°C to +105°C	
Storage Temperature Range	-35°C to +105°C	
Iron Soldering Conditions: 1/16 inch Below Seating Plane for 3 Seconds at 260°C		

#### 5.2. Chip LED Electrical / Optical Characteristics at Ta=25°C

Parameter	Symbol	MIN.	TYP.	MAX.	Unit	Test Condition
Average Luminous Intensity Per Chip	IV	71		165	mcd	IF=5mA Note 1, 2
Chromaticity Coordinates	x		0.294		nm	IF=5mA Note 2
	y		0.286		nm	
Forward Voltage Per Chip	VF	2.7		3.2	V	IF=5mA
Reverse Current Per Chip <sup>(4)</sup>	IR			100	μA	VR=5V
Luminous Intensity Matching Ratio (Similar Light Area)	IV-m			2:1		IF=5mA

#### Notes :

- Luminous intensity is measured with a light sensor and filter combination that approximates the CIE eye-response curve.
- The chromaticity coordinates (x, y) is derived from the 1931 CIE chromaticity diagram.
- Caution in ESD:  
Static Electricity and surge damages the LED. It is recommend to use a wrist band or anti-electrostatic glove when handling the LED. All devices, equipment and machinery must be properly grounded.
- Reverse voltage is only for IR test. It can not continue to operate at this situation.
- Cross talk specification  $\leq 2.5\%$

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### 5.3.ESD (Electrostatic Discharge)

Static Electricity or power surge will damage the LED. Suggestions to prevent ESD damage:

- Use of a conductive wrist band or anti-electrostatic glove when handling these LEDs.
- All devices, equipment, and machinery must be properly grounded.
- Work tables, storage racks, etc. should be properly grounded.
- Use ion blower to neutralize the static charge which might have built up on surface of the LED's plastic for N/D as a result of friction between LEDs during storage and handling.

### 5.4.Bin Code List

VF Spec. Table

VF Bin	Forward Voltage (V) at IF = 5mA	
	MIN.	MAX.
3	2.70	2.80
4	2.80	2.90
5	2.90	3.00
6	3.00	3.10
7	3.10	3.20

Tolerance on each Forward Voltage bin is +/-0.1 volt

IV Spec. Table

IV Bin	Luminous Intensity (mcd) at IF = 5mA	
	Min.	Max.
Q11	71.0	81.0
Q12	81.0	90.0
Q21	90.0	101.0
Q22	101.0	112.0
R11	112.0	129.0
R12	129.0	146.0
R21	146.0	165.0

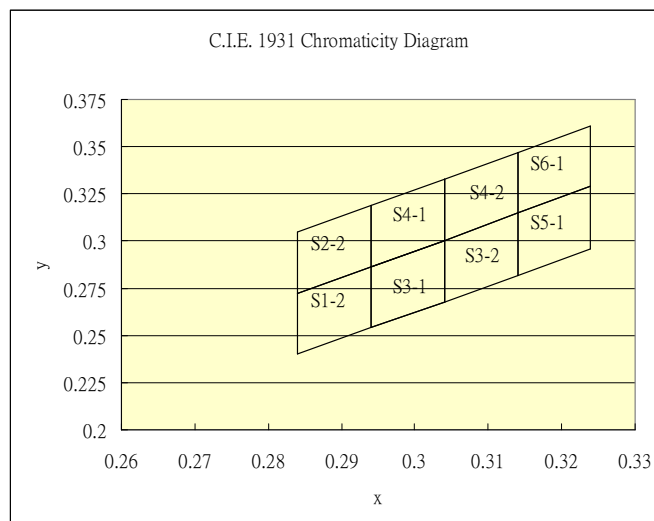
Tolerance on each Luminous Intensity bin is +/- 15%.

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Hue Spec. Table

Hue Bin	Color bin limits at IF = 5mA				
	CIE 1931 Chromaticity coordinates				
S1-2	x	0.284	0.284	0.294	0.294
	y	0.240	0.272	0.286	0.254
S2-2	x	0.284	0.284	0.294	0.294
	y	0.272	0.305	0.319	0.286
S3-1	x	0.294	0.294	0.304	0.304
	y	0.254	0.286	0.300	0.268
S3-2	x	0.304	0.304	0.314	0.314
	y	0.268	0.300	0.315	0.282
S4-1	x	0.294	0.294	0.304	0.304
	y	0.286	0.319	0.333	0.300
S4-2	x	0.304	0.304	0.314	0.314
	y	0.300	0.333	0.347	0.315
S5-1	x	0.314	0.314	0.324	0.324
	y	0.282	0.315	0.329	0.296
S6-1	x	0.314	0.314	0.324	0.324
	y	0.315	0.347	0.361	0.329

Tolerance on each Hue (x, y) bin is +/- 0.01.





## LED DISPLAY LTD-3812SW-P

### 5.5. Typical Electrical / Optical Characteristics Curves

(25°C Ambient Temperature Unless Otherwise Noted)

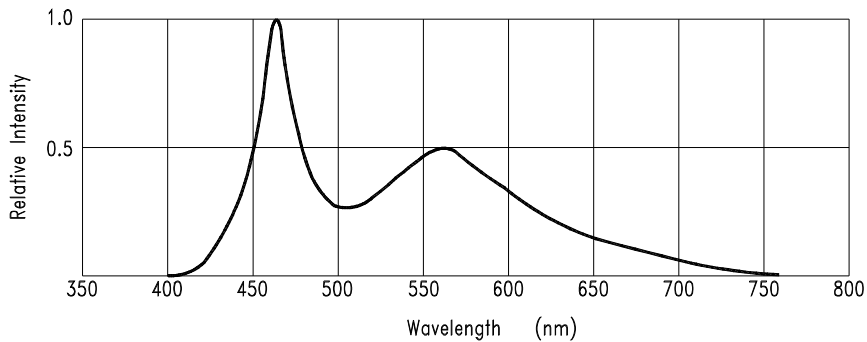


Fig.1 RELATIVE INTENSITY VS. WAVELENGTH

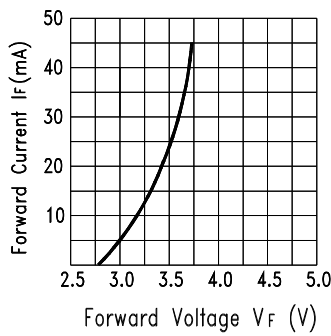


Fig.2 Forward Current vs. Forward Voltage

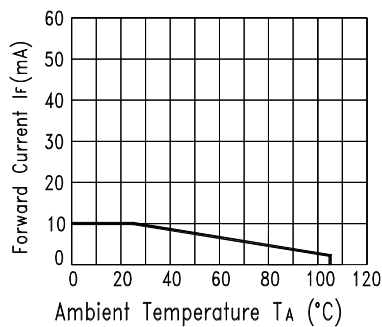


Fig.3 Forward Current Derating Curve

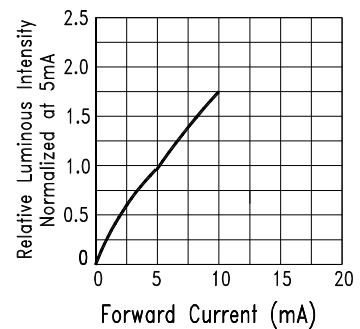


Fig.4 Relative Luminous Intensity vs. Forward Current

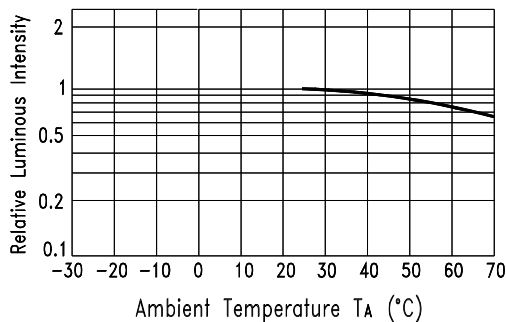


Fig.5 Luminous Intensity vs. Ambient Temperature

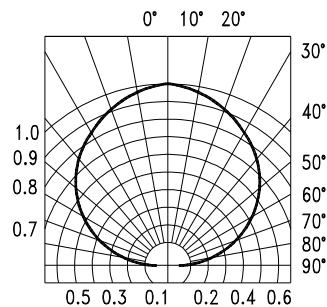


Fig.6 Spatial Distribution

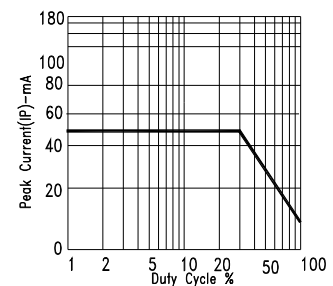
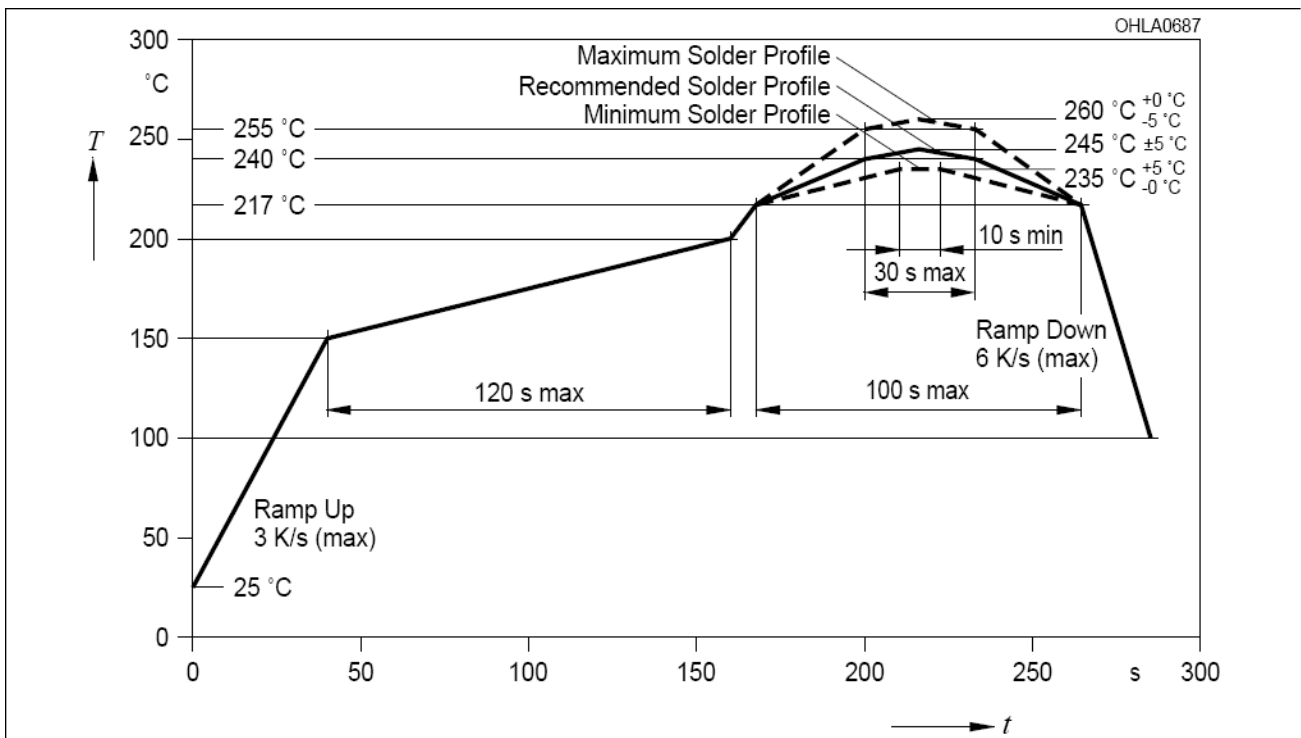


Fig.7 MAX. PEAK CURRENT VS. DUTY CYCLE % (REFRESH RATE 1KHz)

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### 6. SMT SOLDERING INSTRUCTION

(Number of reflow process shall be less than 2 times, and cooling process to normal temperature is required between the first and the second soldering process)



#### Notes :

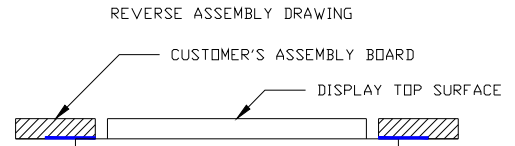
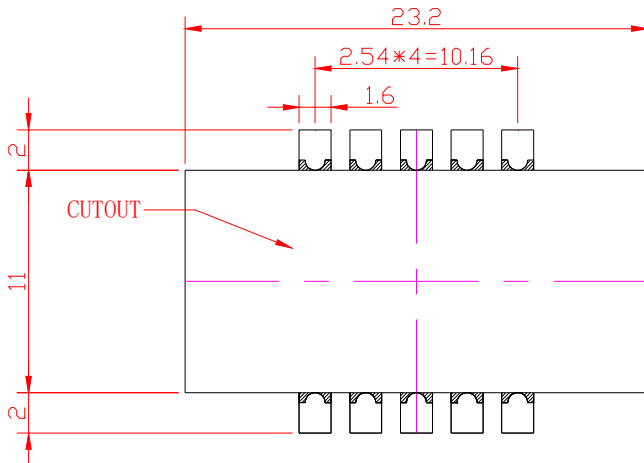
1. Recommended soldering condition

Reflow Soldering (Two times only)		Soldering Iron (One time only)	
Pre-heat:	120~150°C.	Temperature	300°C Max.
Pre-heat time:	120sec. Max.	Soldering time	3sec. Max.
Peak temperature:	260°C Max.		
Soldering time:	5sec. Max.		

2. Number of reflow process shall be less than 2 times, and cooling process to normal temperature is required between the first and the second soldering process.

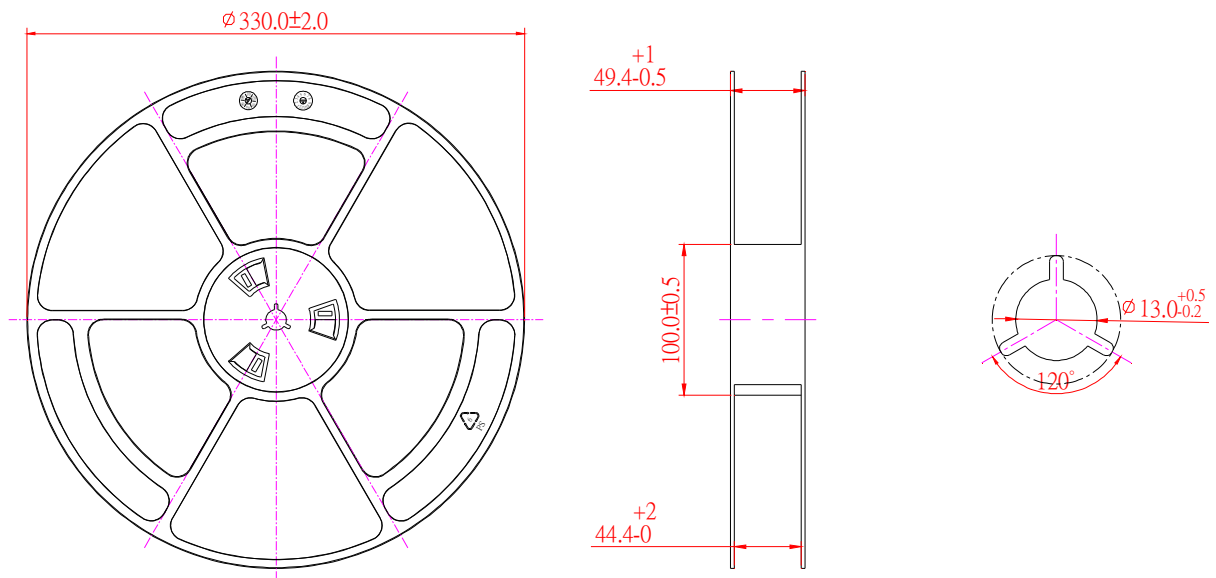
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**7. Recommended Soldering Pattern**



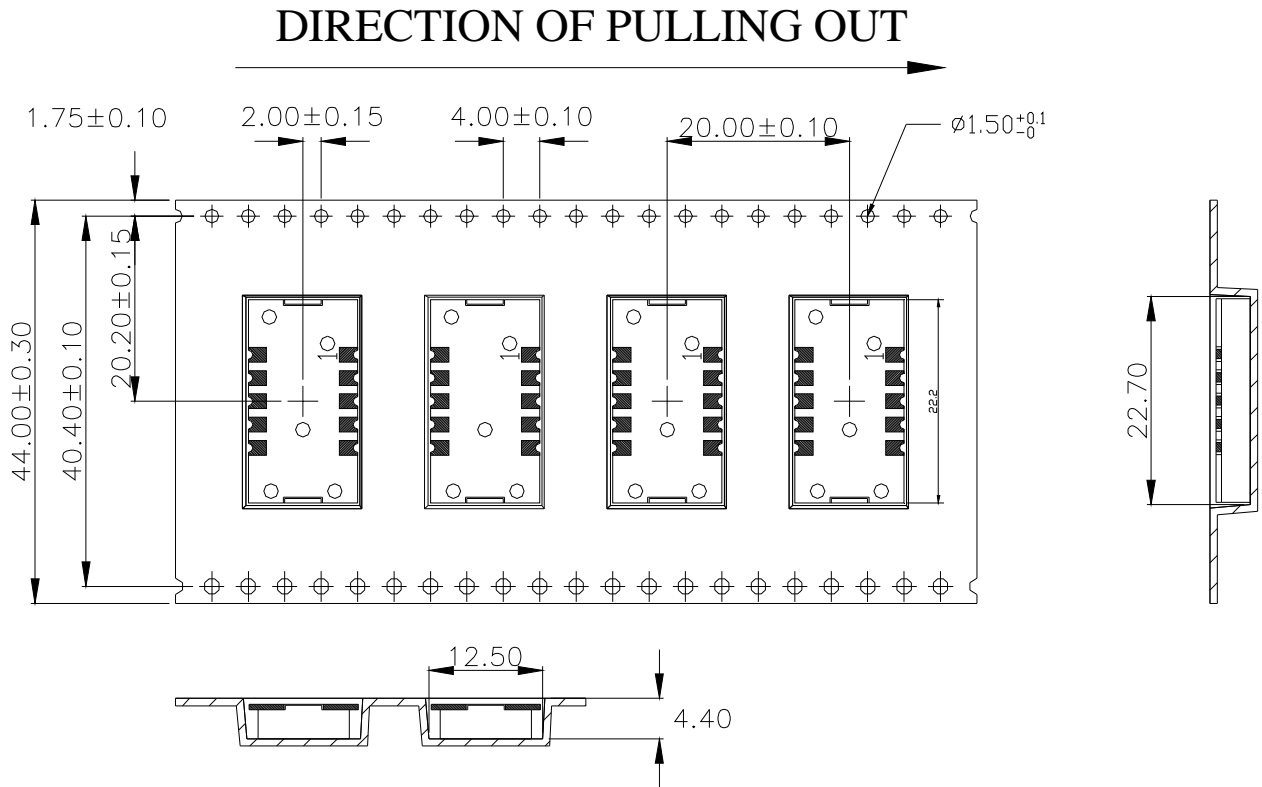
**8. Packing Specification**

**8.1. Packing Reel Dimensions**



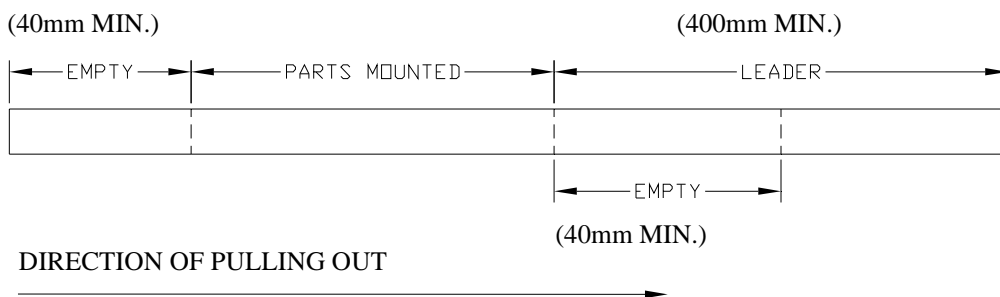
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**8.2. Packing Carrier Dimensions**



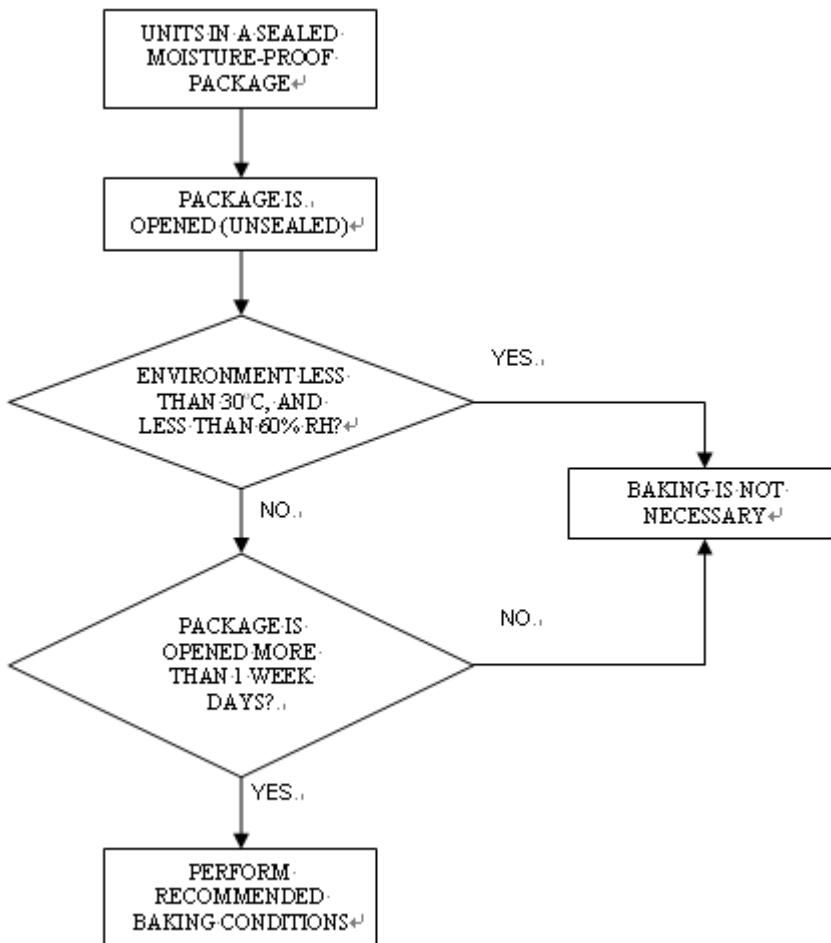
1. Component load per 13" reel : 700 pcs.
2. Minimum packing quantity is 250 pcs for remainders

**8.3. Trailer part / Leader part**



### 9. Moisture Proof Packing

All N/D SMD displays are shipped in moisture proof package. The displays should be stored at 30°C or less and 60 % RH or less. Once the package opened, moisture absorption begins.



If the parts are not stored in dry conditions, they must be baked before reflow to prevent damage to the parts. Baking should only be done once

Package	Temperature	Time
In Reel	60°C	≥ 48hours
In Bulk	100°C	≥ 4hours
	125°C	≥ 2hours