



# LED Display Product Data Sheet LTS-5825SW-P

Spec No.: DS30-2012-0049

Effective Date: 06/09/2012

Revision: -

**LITE-ON DCC**

**RELEASE**

BNS-OD-FC001/A4



# LITE-ON TECHNOLOGY CORPORATION

Property of Lite-on Only

## LED DISPLAY

### LTS-5825SW-P DATA SHEET

<u>ITEM</u>	<u>Description</u>	<u>By</u>	<u>DATE</u>
1	New Spec	Eason Lin	2011/11/24

**FEATURES**

- \* 0.56 inch (14.22 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
- \* SMD DISPLAY
- \* **LEAD FREE PACKAGE (ACCORDING TO ROHS)**

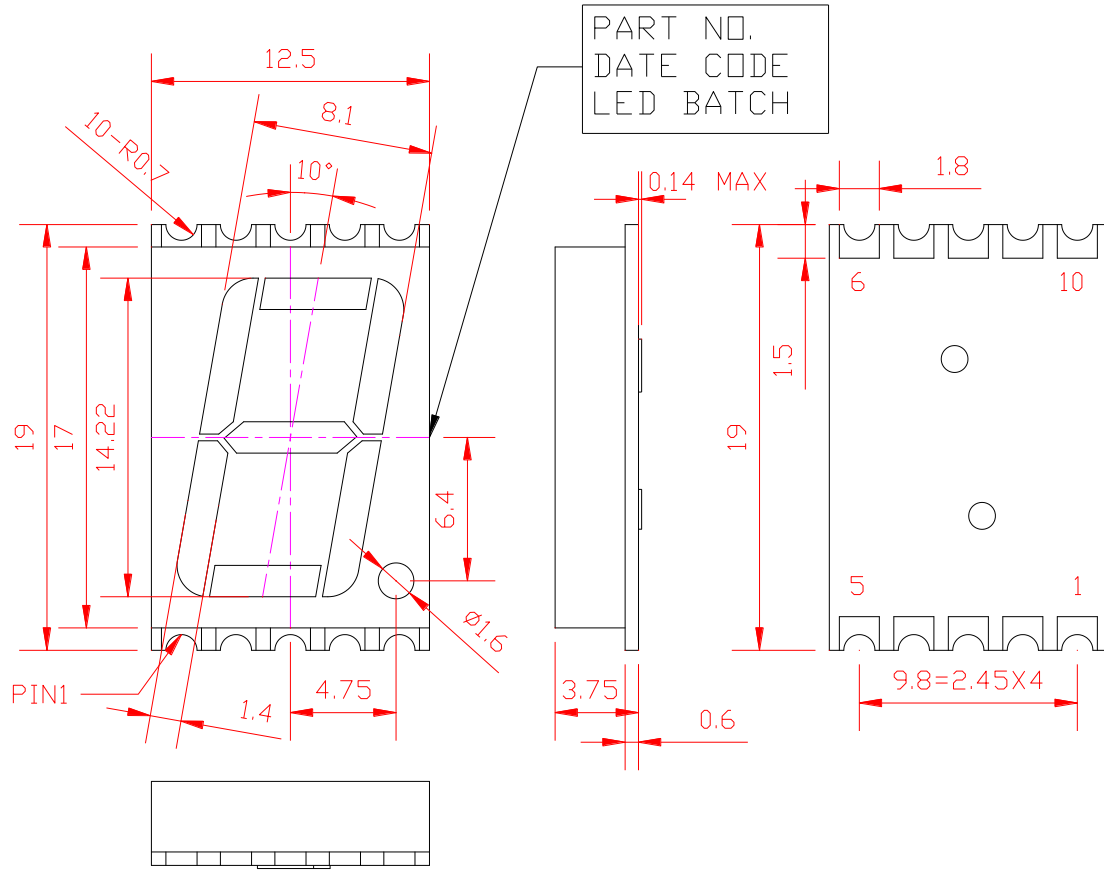
**DESCRIPTION**

The LTS-5825SW-P is a 0.56inch (14.22mm) digit height single digit SMD display. This device uses LTW-C193DS5-ND2 InGaN white chips. The display has gray face and white segments.

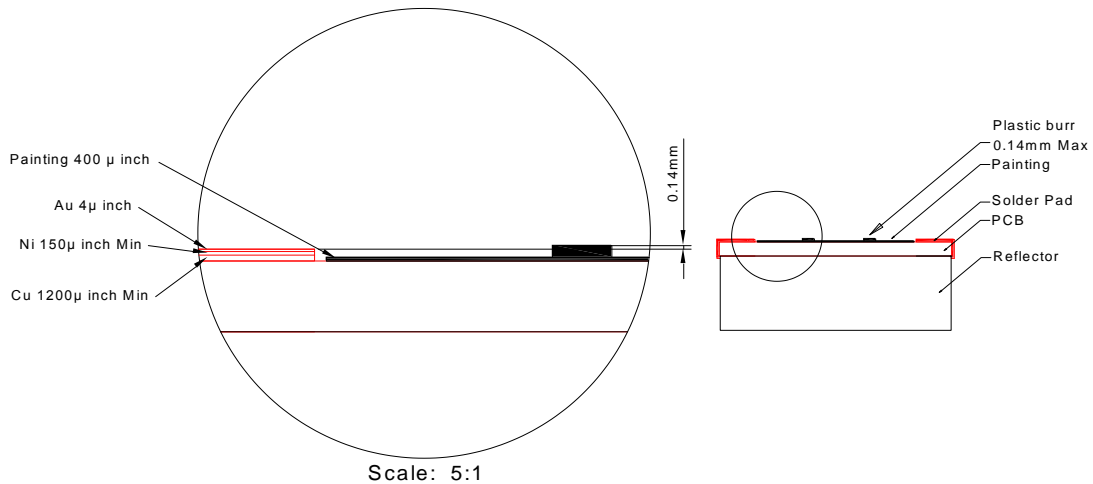
**DEVICE**

<b>PART NO.</b>	<b>DESCRIPTION</b>
InGaN White	Common Anode
LTS-5825SW-P	

**PACKAGE DIMENSIONS**



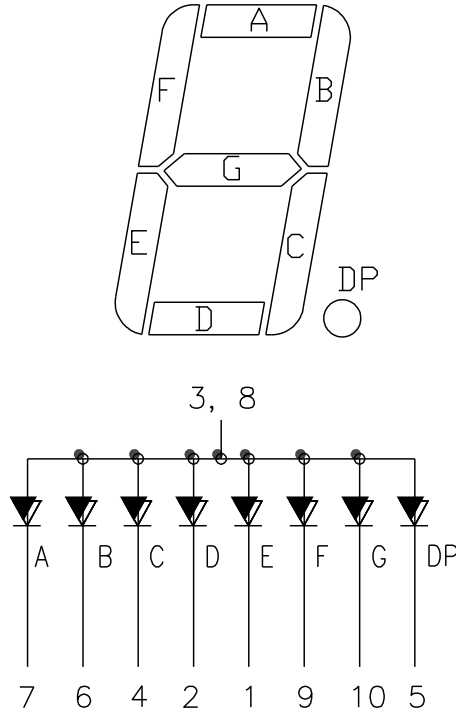
**Solder Pad Vs Painting Diagram**



**NOTES:**

1. Plastic pins' burr maximum 0.14 mm, warping of PCB maximum 0.06 mm.
2. All dimensions are in millimeters. Tolerances are  $\pm 0.25\text{mm}$  ( $0.01''$ ) unless otherwise noted.
3. Solder pad materials and thickness: Cu: 1200  $\mu$  inch Ni: Min 150  $\mu$  inch Au: 4  $\mu$  inch.

**INTERNAL CIRCUIT DIAGRAM**



**PIN CONNECTION**

No.	CONNECTION
1	CATHODE E
2	CATHODE D
3	COMMON ANODE
4	CATHODE C
5	CATHODE DP
6	CATHODE B
7	CATHODE A
8	COMMON ANODE
9	CATHODE F
10	CATHODE G

### CHIP LED ABSOLUTE MAXIMUM RATING AT Ta = 25°C

PARAMETER	MAXIMUM RATING	UNIT
Power Dissipation Per Segment	35	mW
Peak Forward Current (1/10 Duty Cycle, 0.1ms Pulse Width)	50	mA
Continuous Forward Current Per Segment	10	mA
Forward Current Derating from 25°C	0.27	mA/°C
Operating Temperature Range	-35°C to + 80°C	
Storage Temperature Range	-55°C to + 105°C	
Soldering Temperature	260°C For 5 Seconds	

### CHIP LED ELECTRICAL / OPTICAL CHARACTERISTICS AT Ta = 25°C

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITION
Luminous Intensity	IV	71		165	mcd	IF = 5mA Note 1, 2, 5
Chromaticity Coordinates	x		0.294			IF = 5mA Note 3, 5
	y		0.286			
Forward Voltage Per Segment	V <sub>F</sub>	2.70		3.15	V	IF = 5mA
Reverse Current Per Segment <sup>(7)</sup>	I <sub>R</sub>			100	μA	V <sub>R</sub> =5V
Luminous Intensity Matching Ratio	Iv-m			2:1		I <sub>F</sub> =5mA

Note:

1. Luminous intensity is measured with a light sensor and filter combination that approximates the CIE (Commision Internationale De L'Eclairage) eye-response curve.
2. Iv classification code is marked on each packing bag.
3. The chromaticity coordinates (x, y) is derived from the 1931 CIE chromaticity diagram.
4. Caution in ESD:  
Static Electricity and surge damages the LED. It is recommend using a wrist band or anti-electrostatic glove when handling the LED. All devices, equipment and machinery must be properly grounded.
5. Tester: CAS140B is for the chromaticity coordinates (x, y) and IV.
6. The chromaticity coordinates (x, y) guarantee should be added ± 0.01 tolerance.
7. Reverse voltage is only for IR test. It can not continue to operate at this situation.
8. Crosstalk speciation ≤ 2.5%

**TYPICAL ELECTRICAL / OPTICAL CHARACTERISTIC CURVES**

(25°C Ambient Temperature Unless Otherwise Noted)

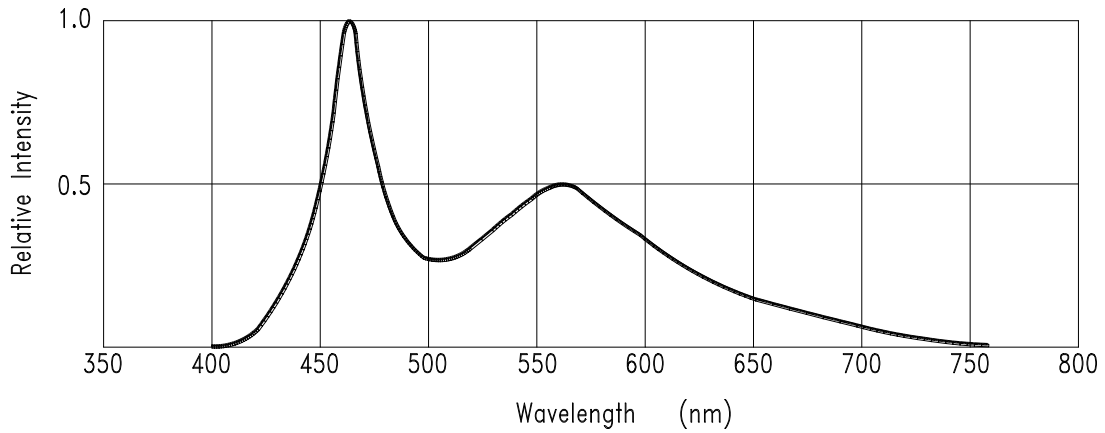


Fig.1 RELATIVE INTENSITY VS. WAVELENGTH

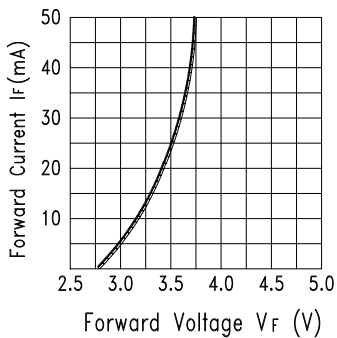


Fig.2 Forward Current vs. Forward Voltage

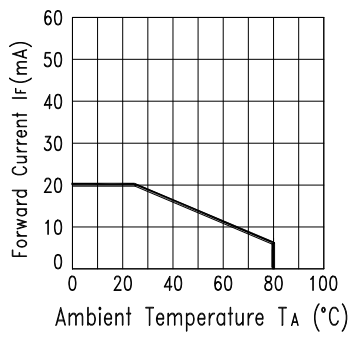


Fig.3 Forward Current Derating Curve

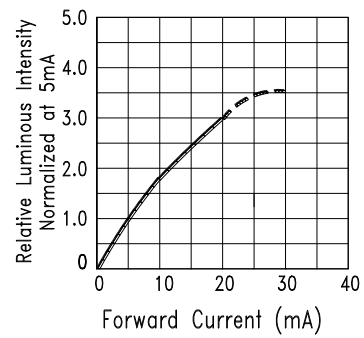


Fig.4 Relative Luminous Intensity vs. Forward Current

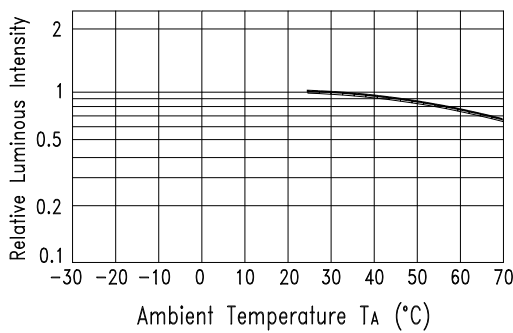


Fig.5 Luminous Intensity vs. Ambient Temperature

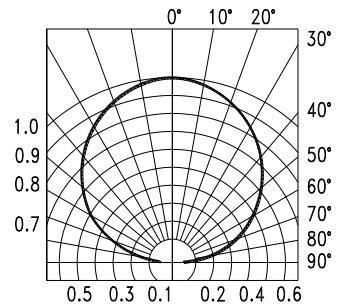


Fig.6 Spatial Distribution

### Chip LED 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%.

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

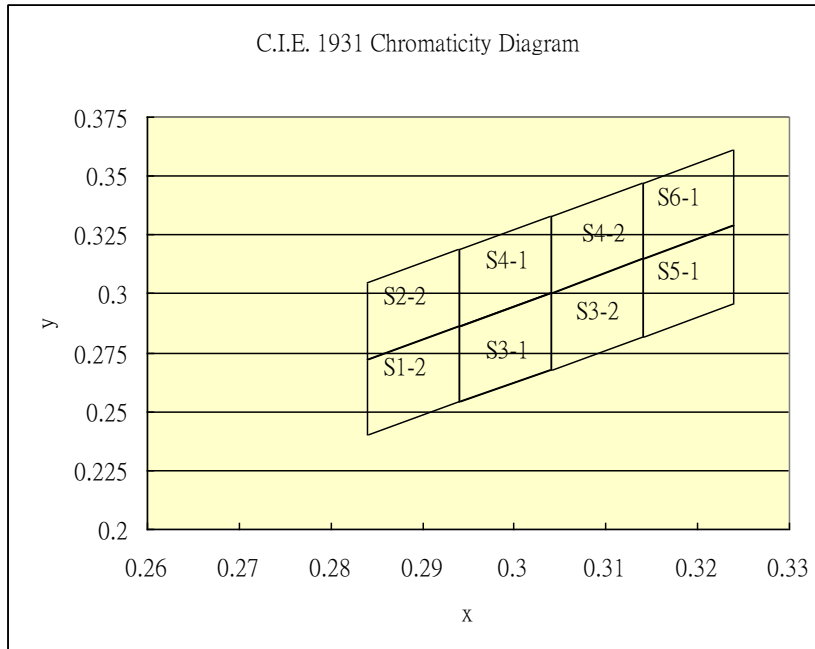


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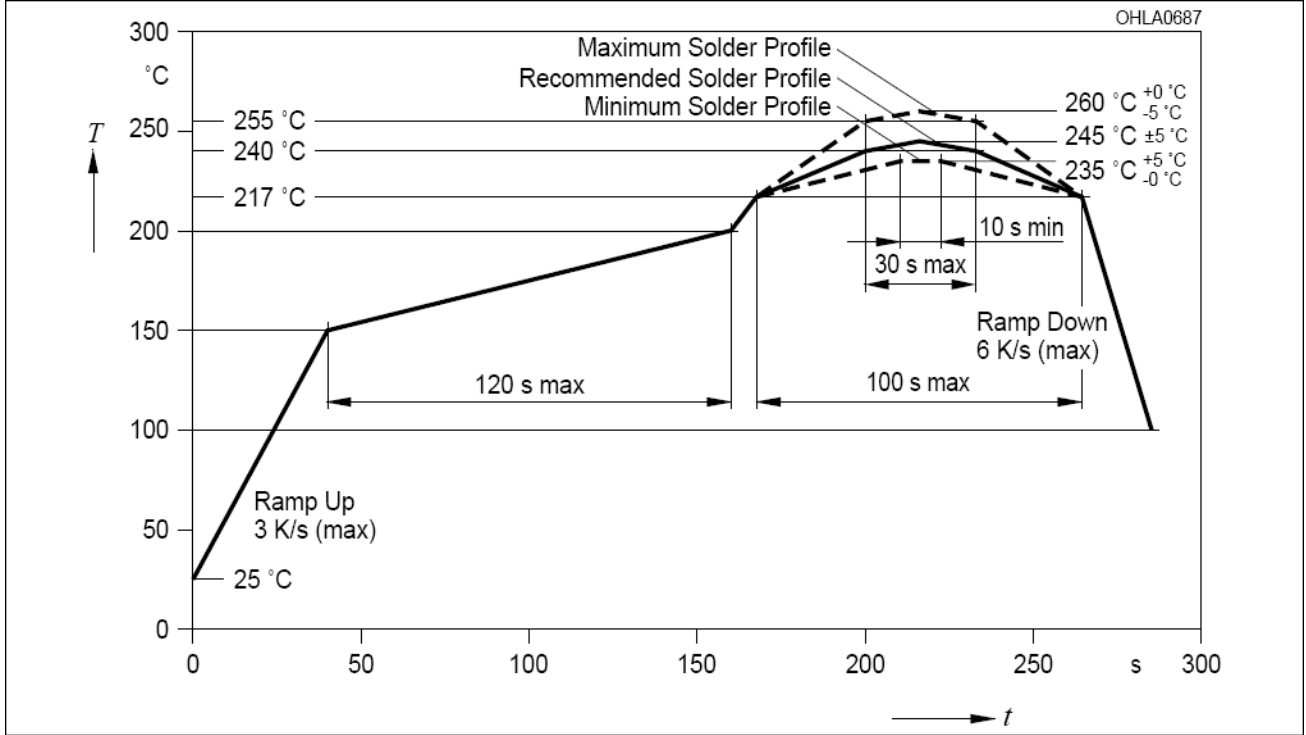
S4-2	x	0.304	0.304	0.314	0.314
	y	0.300	0.333	0.347	0.315
S5-1	x	0.314	0.314	0.324	0.324
	y	0.282	0.315	0.329	0.296
S6-1	x	0.314	0.314	0.324	0.324
	y	0.315	0.347	0.361	0.329

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

C.I.E. 1931 Chromaticity Diagram



**SMT SOLDERING INSTRUCTION**



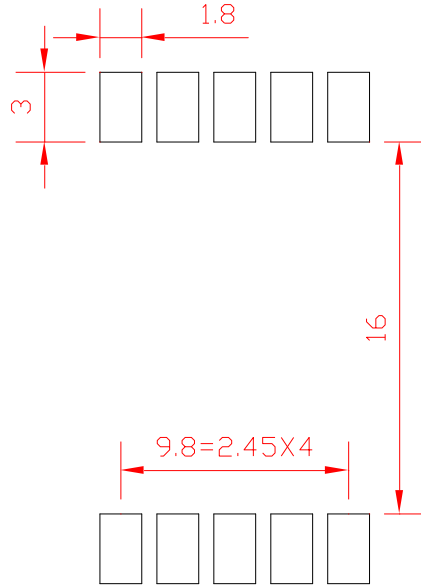
Note:

1. Recommended soldering condition:

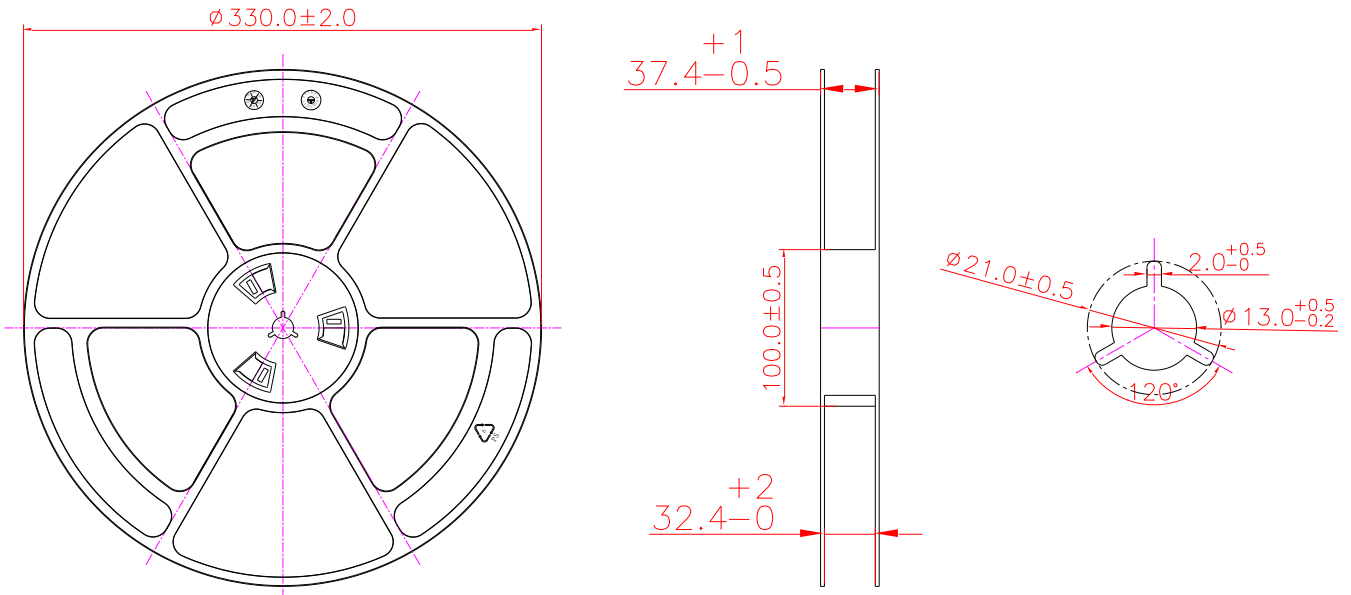
Reflow Soldering (Two times only)		Soldering Iron (One time only)	
Pre-heat:	120~150°C.	Temperature	300°C Max.
Pre-heat time:	120sec. Max.	Soldering time	3sec. Max.
Peak temperature:	260°C Max.		
Soldering time:	5sec. Max.		

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.

**RECOMMENDED SOLDERING PATTERN (UNIT: MM)**

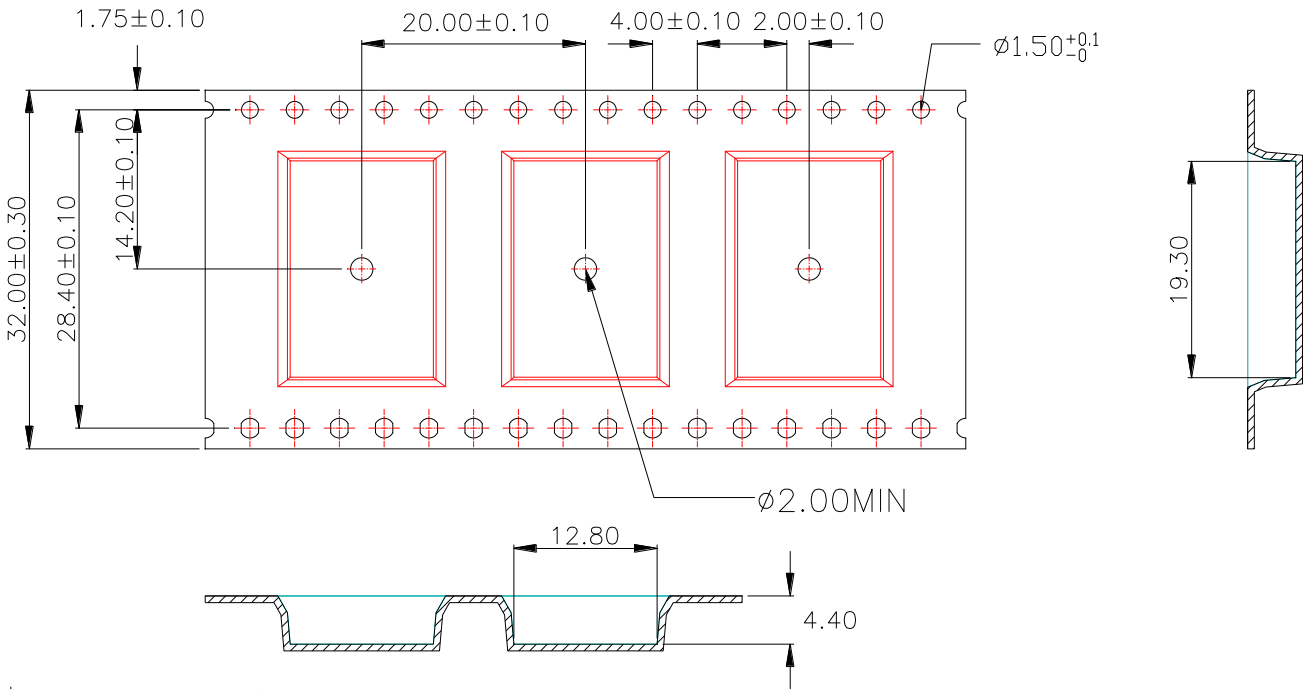


**PACKING REEL DIMENSIONS**



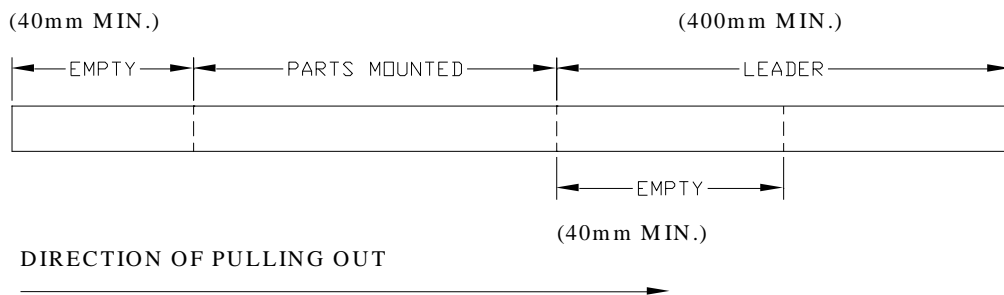
**PACKING CARRIER DIMENSIONS**

**1. Taping parts:**



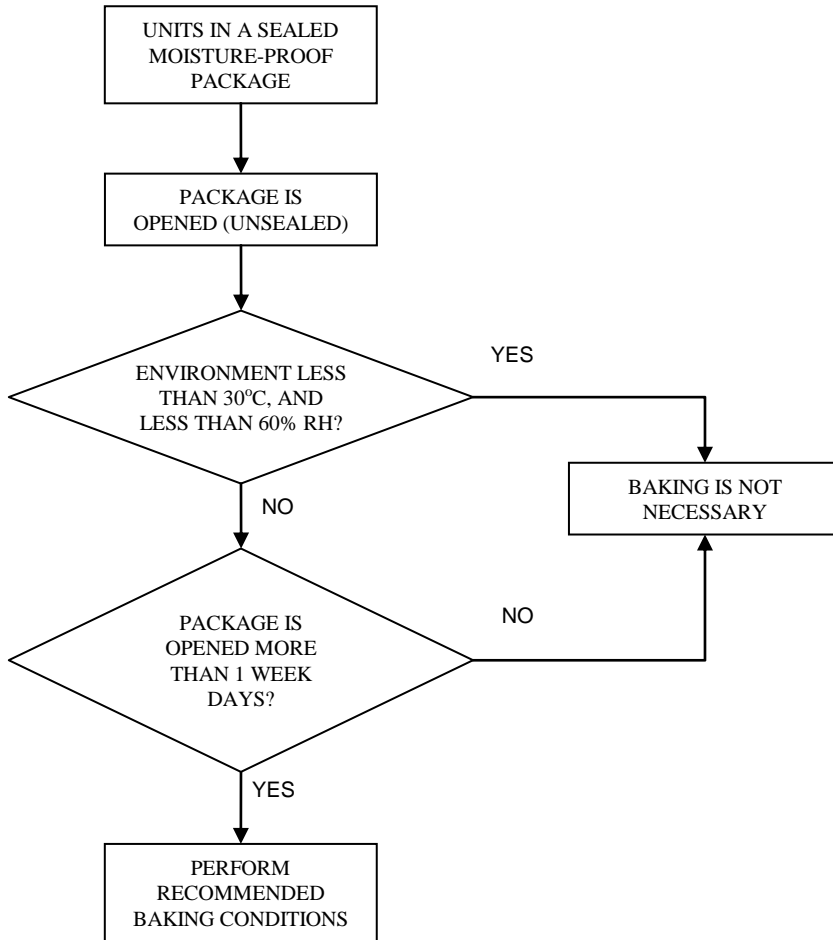
- 1. 10 sprocket hole pitch cumulative tolerance  $\pm 0.20$ .
- 2. Carrier camber is within 1 mm in 250 mm.
- 3. Material : Black Conductive Polystyrene Alloy.
- 4. All dimensions meet EIA-481-D requirements.
- 5. Thickness :  $0.30 \pm 0.05$  mm.
- 6. Packing length per 22" reel : 44.5 Meters.(1:3)
- 7. Component load per 13" reel : 700 pcs.

**2. Trailer part/ Leader part:**



**Moisture Proof Packaging**

All N/D SMD displays are shipped in moisture proof package. The displays should be stored at 30°C or less and 90% RH or less. Once the package opened, moisture absorption begins.



**Baking Conditions**

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

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

**Baking should only be done once.**