



LED Display
Product Data Sheet
LTS-5825SW-P

Spec No. :DS30-2012-0049
Effective Date: 12/24/2019
Revision: B

LITE-ON DCC

RELEASE

BNS-OD-FC001/A4

**LED DISPLAY
LTS-5825SW-P**

LED DISPLAY

LTS-5825SW-P

| <u>Rev</u> | <u>Description</u> | <u>By</u> | <u>Date</u> |
|---|------------------------------------|-----------|-------------|
| 01 | Preliminary Spec. | Eason Lin | 11/24/2011 |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| Above data for PD and Customer tracking only | | | |
| - | NPPR Received and Upload on System | Reo Lin | 06/09/2012 |
| A | Update Packing spec. in page 12 | Reo Lin | 12/02/2019 |
| B | Update Packing spec. in page 12 | Reo Lin | 12/20/2019 |
| | | | |

LED DISPLAY LTS-5825SW-P

1. Description

The LTS-5825SW-P is a 0.56 inch (14.22 mm) digit height single digit SMD display. This device uses InGaN white chip LED, which are made from InGaN on a Sapphire substrate. The display has gray face and white segments.

1.1 Features

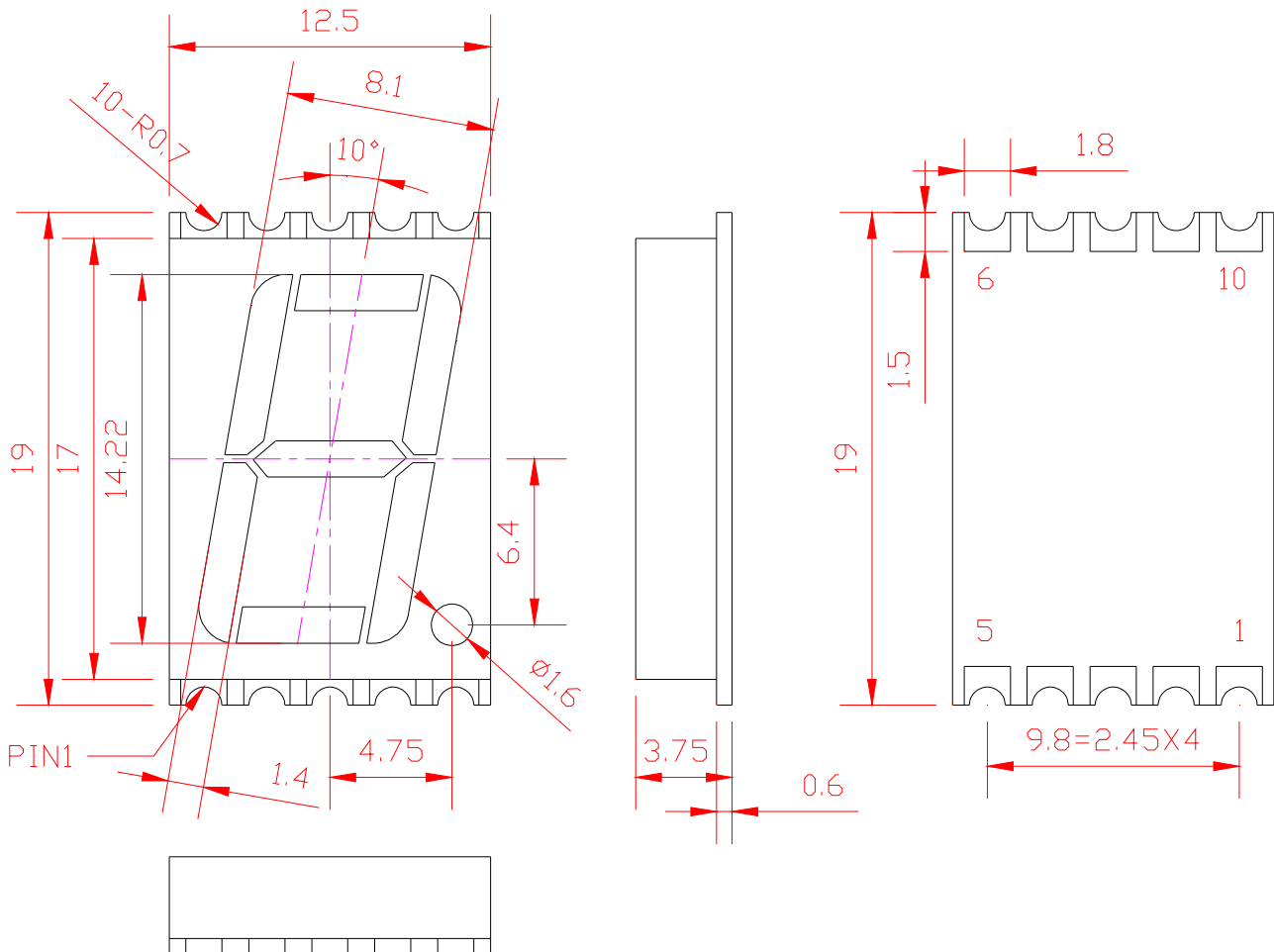
- 0.56 inch (14.22 mm) DIGIT HEIGHT
- CONTINUOUS UNIFORM SEGMENTS
- LOW POWER REQUIREMENT
- EXCELLENT CHARACTERS APPEARANCE
- HIGH BRIGHTNESS & HIGH CONTRAST
- WIDE VIEWING ANGLE
- SOLID STATE RELIABILITY
- CATEGORIZED FOR LUMINOUS INTENSITY.
- LEAD-FREE PACKAGE (ACCORDING TO ROHS)

1.2 Device

| Part No | Description |
|--------------|------------------|
| InGaN White | Common Anode |
| LTS-5825SW-P | Rt. Hand Decimal |

**LED DISPLAY
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2. Package Dimensions

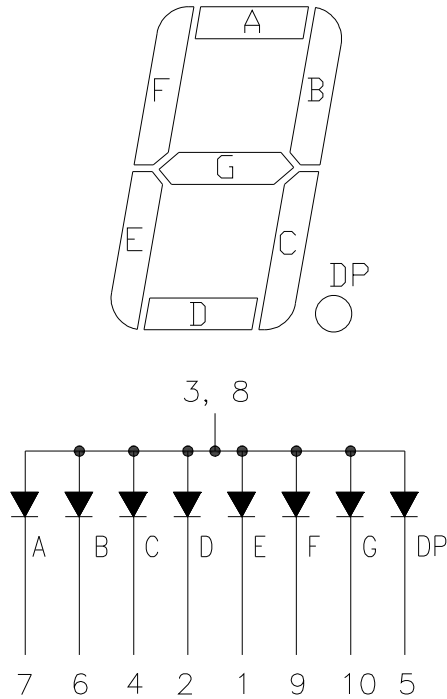


Notes :

1. All dimensions are in millimeters. Tolerances are ± 0.25 mm (0.01") unless otherwise noted
2. Foreign material on segment ≤ 10 mil
3. Ink contamination (surface) ≤ 20 mils
4. Bubble in segment ≤ 10 mil
5. Bending $\leq 1\%$ of reflector length
6. Plastic pin's burr max is 0.14 mm

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3. Internal Circuit Diagram



4. 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 |

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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 0.1 | 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. 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 3 |
| | y | | 0.286 | | nm | |
| Forward Voltage Per Chip | VF | 2.7 | | 3.2 | V | IF=5mA |
| Reverse Current Per Chip ⁽⁴⁾ | 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 |

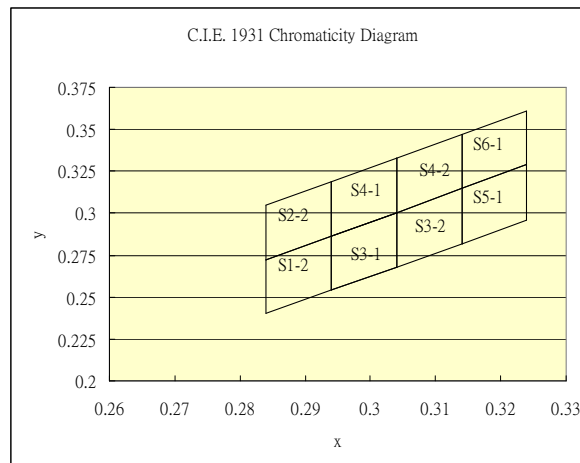
Tolerance on each Luminous Intensity bin is +/- 15%.

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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.



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5.5. Typical Electrical / Optical Characteristics Curves

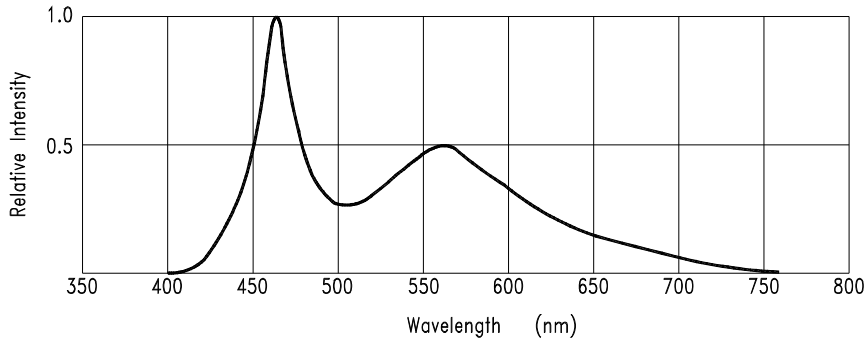


Fig.1 RELATIVE INTENSITY VS. WAVELENGTH

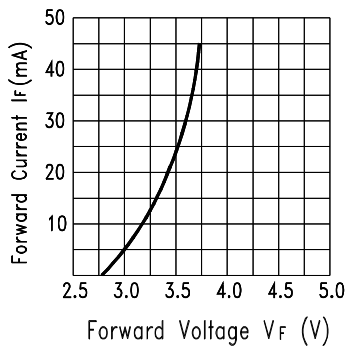


Fig.2 Forward Current vs. Forward Voltage

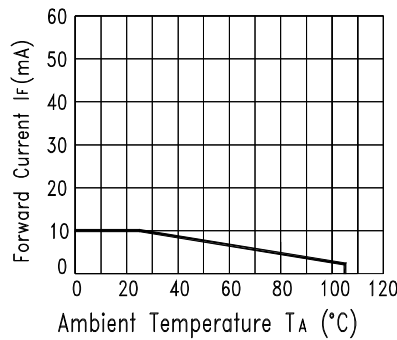


Fig.3 Forward Current Derating Curve

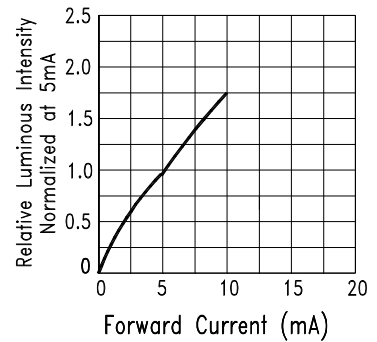


Fig.4 Relative Luminous Intensity vs. Forward Current

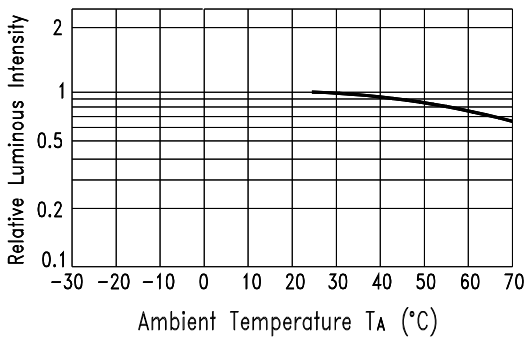


Fig.5 Luminous Intensity vs. Ambient Temperature

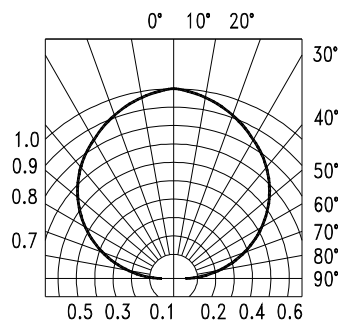


Fig.6 Spatial Distribution

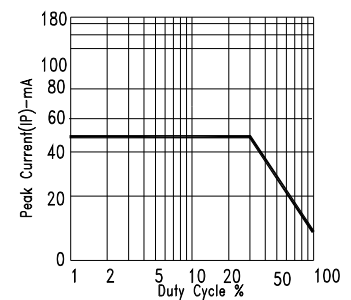
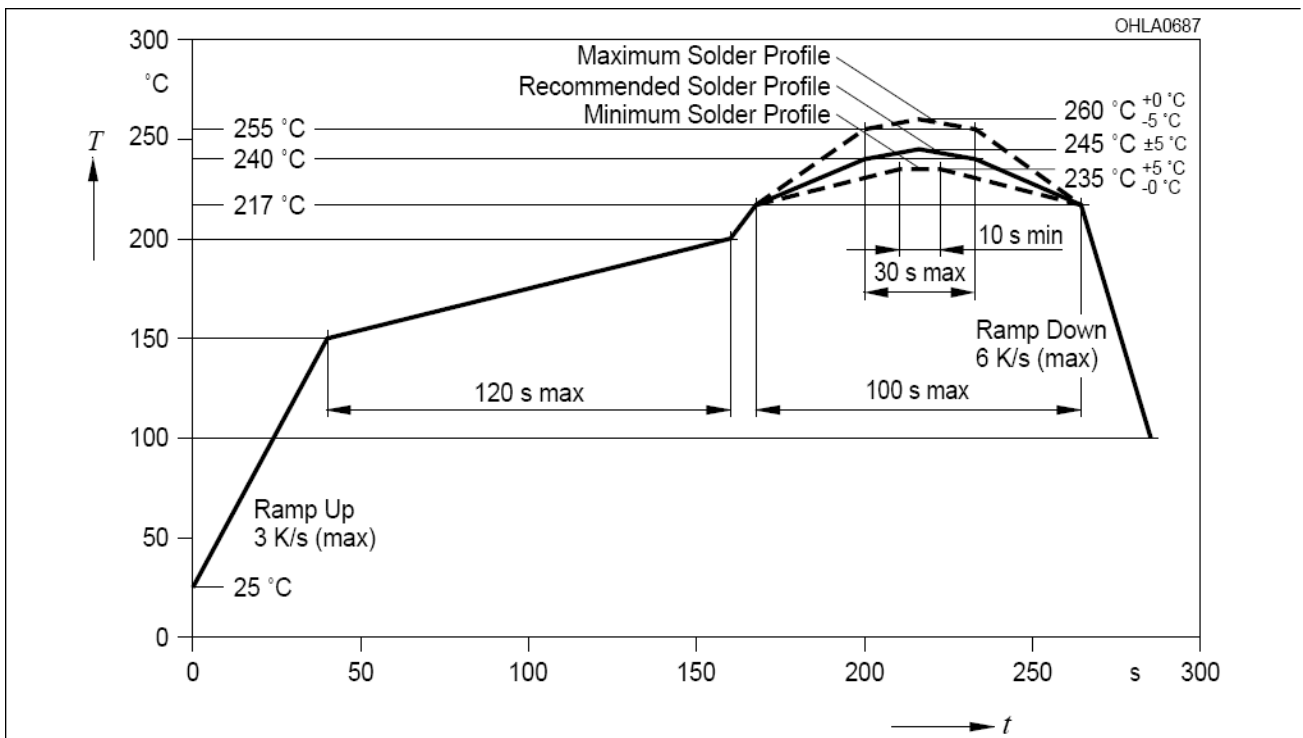


Fig.7 MAX. PEAK CURRENT VS. DUTY CYCLE % (REFRESH RATE 1KHz)

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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 :

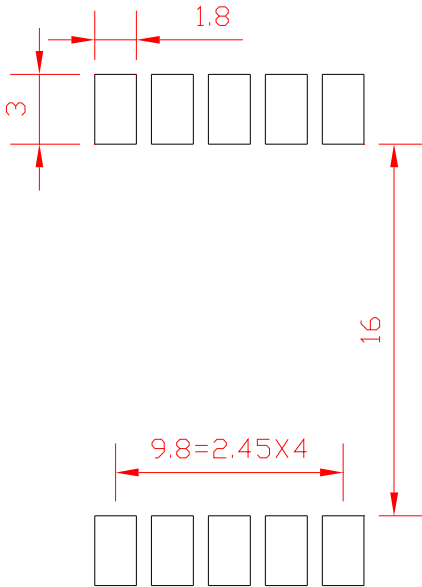
1. Recommended soldering condition

| 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.

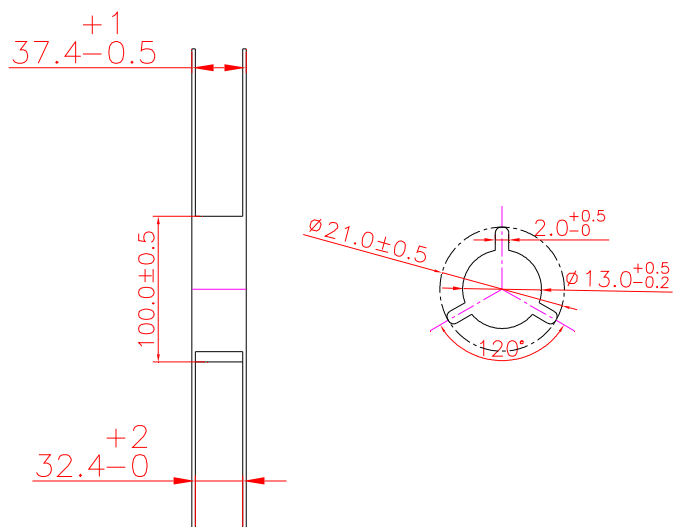
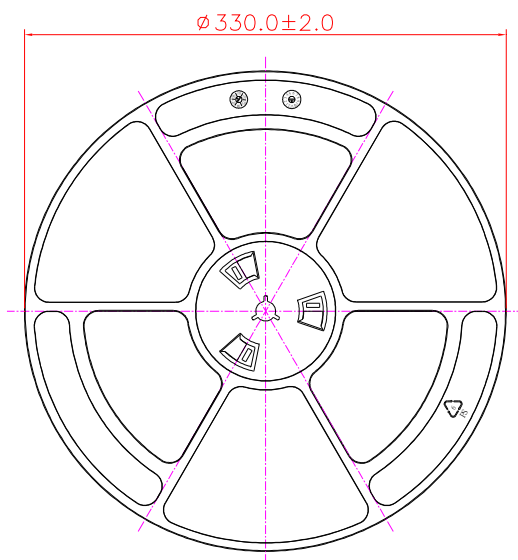
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7. Recommended Soldering Pattern



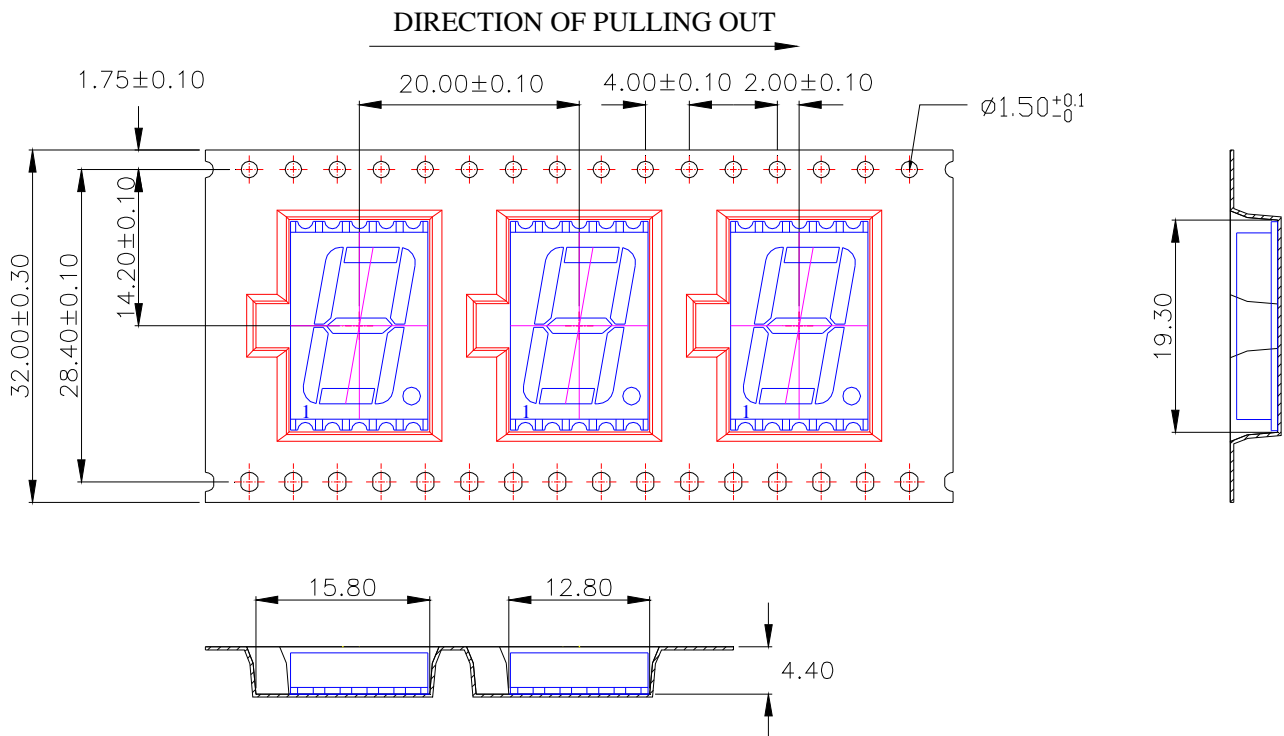
8. Packing Specification

8.1. Packing Reel Dimensions



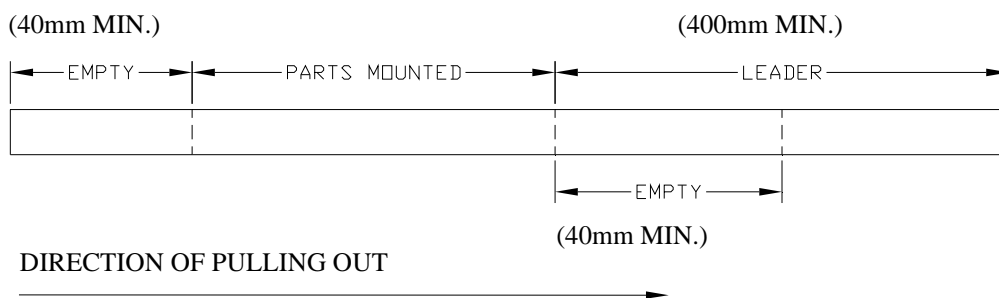
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8.2. Packing Carrier Dimensions



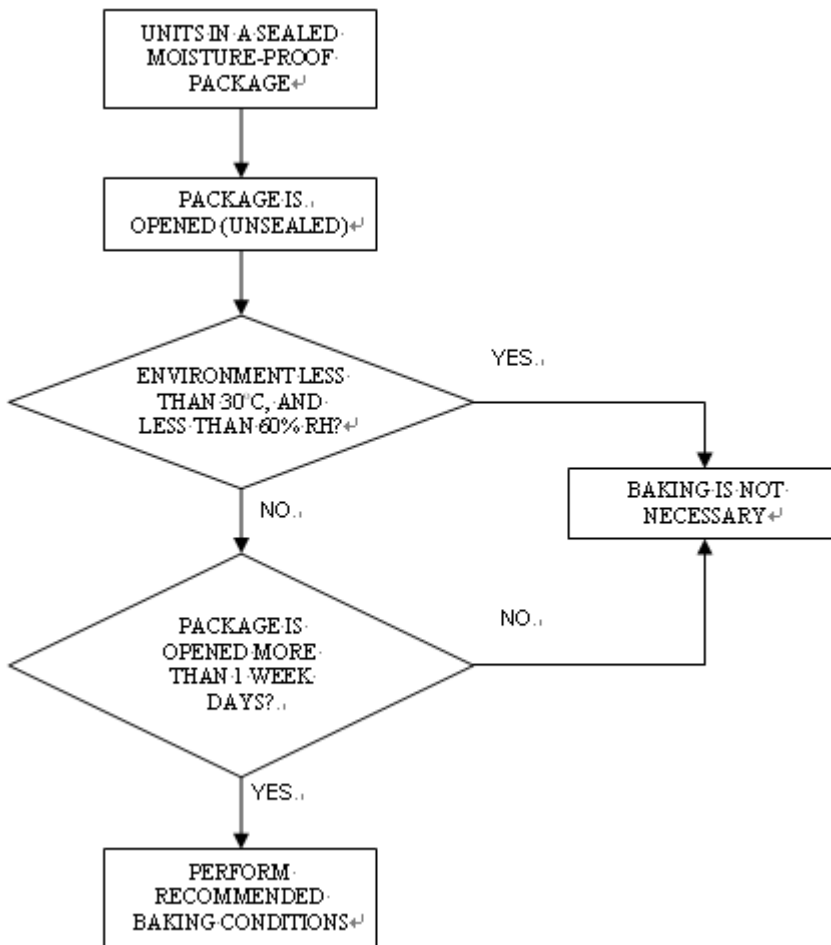
1. 10 sprocket hole pitch cumulative tolerance ± 0.20 .
2. Carrier camber is within 1 mm in 250 mm.
3. Material : Black Conductive Polystyrene Alloy.
4. All dimensions meet EIA-481-D requirements.
5. Thickness : 0.30 ± 0.05 mm.
6. Packing length per 22" reel : 44.5 Meters.(1:3)
7. Component load per 13" reel : 700 pcs.
8. Minimum packing quantity is 200 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 |