LITEON®
OPTOELECTRONICS

LED Display
Product Data Sheet
LTS-4817SW-P

Spec No. :DS30-2011-0178
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Revision: A

LITE-ON DCC

RELEASE

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LED DISPLAY

LTS-4817SW-P

Rev	Description	By	Date
01	Preliminary Spec.	Reo Lin	08/24/2011
02	2.1 Modify packing dimension 2.2 Modify recommended soldering pattern	Reo Lin	09/21/2011
Above data for PD and Customer tracking only			
-	NPPR Received and Upload on System	Reo Lin	09/21/2011
A	Update Packing spec. in page 12	Reo Lin	01/06/2020

LED DISPLAY
LTS-4817SW-P

1. Description

The LTS-4817SW-P is a 0.39 inch (10.0mm) 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 and suitable for reverse mount assembly.

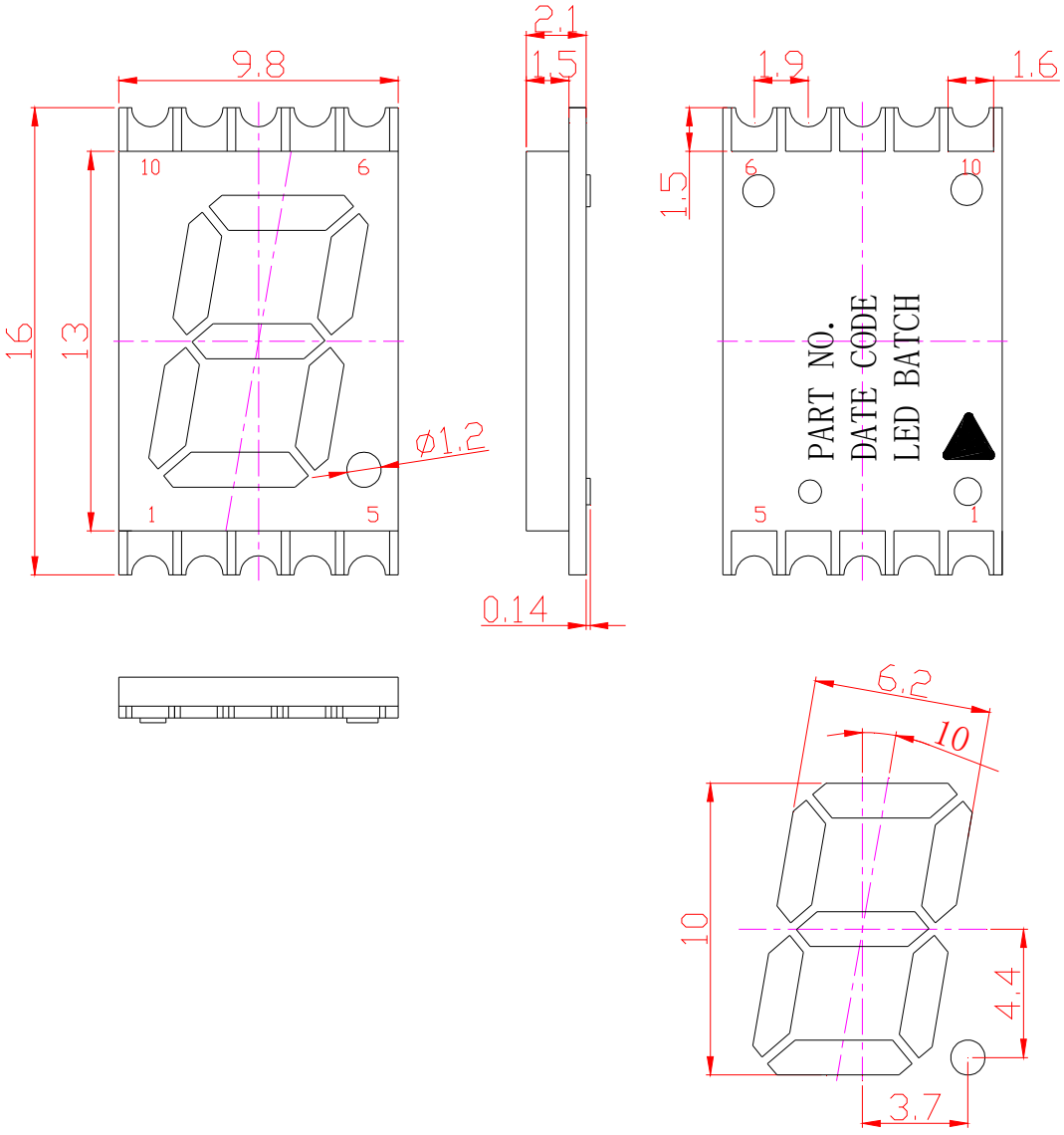
1.1 Features

- 0.39 inch (10.0 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-4817SW-P	Rt. Hand Decimal

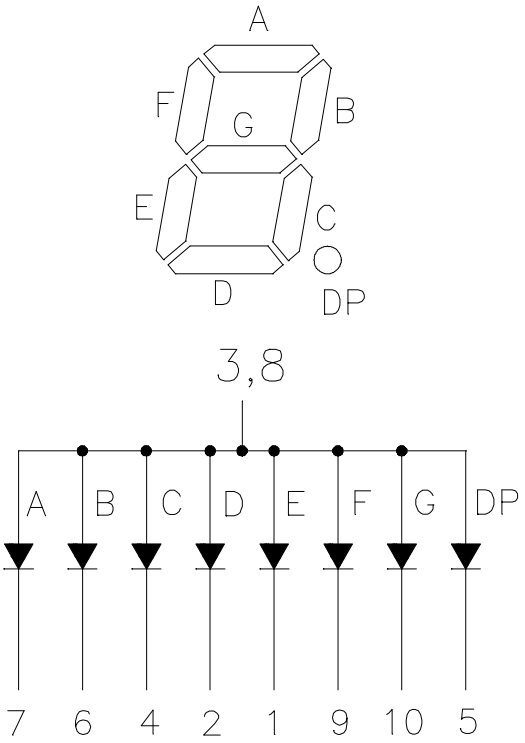
2. Package Dimensions



Notes :

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

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

5. Rating and Characteristics

5.1. CHIP LED Absolute Maximum Rating at Ta=25℃

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℃ Per Segment	10 0.11	mA mA/℃
Operating Temperature Range	-35℃ to +105℃	
Storage Temperature Range	-35℃ to +105℃	
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℃

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 :

1. Luminous intensity is measured with a light sensor and filter combination that approximates the CIE eye-response curve.
2. The chromaticity coordinates (x, y) is derived from the 1931 CIE chromaticity diagram.
3. 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.
4. Reverse voltage is only for IR test. It can not continue to operate at this situation.
5. Cross talk specification ≦ 2.5%

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

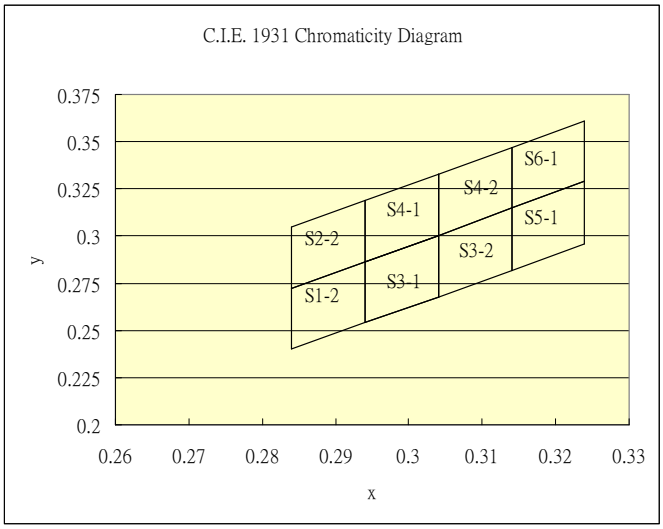
IV Bin	Luminous Intensity (mcd) at IF = 5mA	
	Min.	Max.
Q11	71.0	81.0
Q12	81.0	90.0
Q21	90.0	101.0
Q22	101.0	112.0
R11	112.0	129.0
R12	129.0	146.0
R21	146.0	165.0

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

Hue Spec. Table

Hue Bin	Color bin limits at IF = 5mA				
	CIE 1931Chromaticity 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.



5.5. Typical Electrical / Optical Characteristics Curves

(25℃ Ambient Temperature Unless Otherwise Noted)

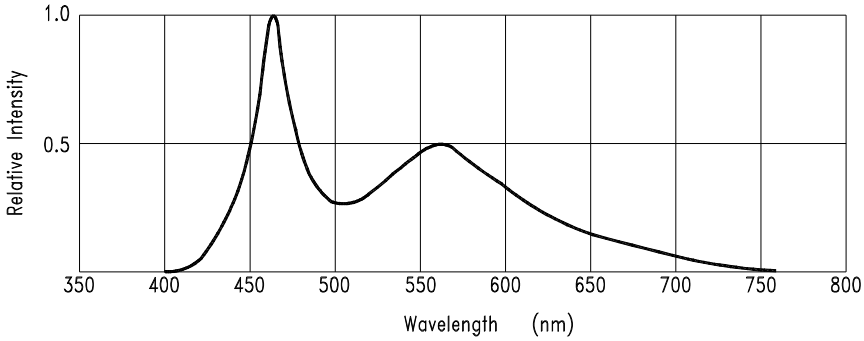


Fig.1 RELATIVE INTENSITY VS. WAVELENGTH

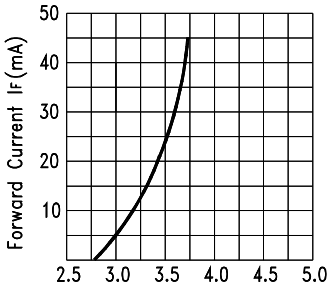


Fig.2 Forward Current vs. Forward Voltage

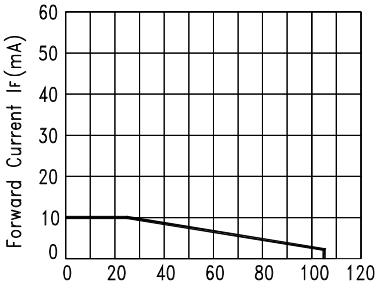


Fig.3 Forward Current Derating Curve

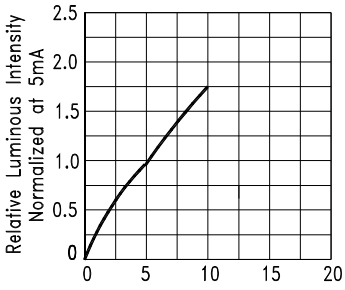


Fig.4 Relative Luminous Intensity vs. Forward Current

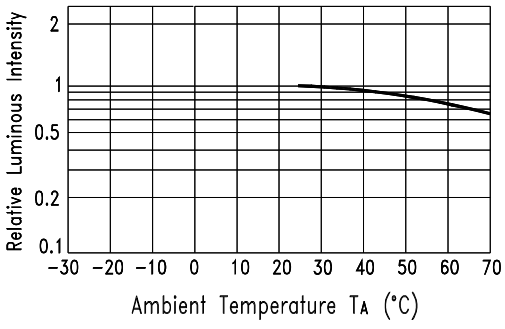


Fig.5 Luminous Intensity vs. Ambient Temperature

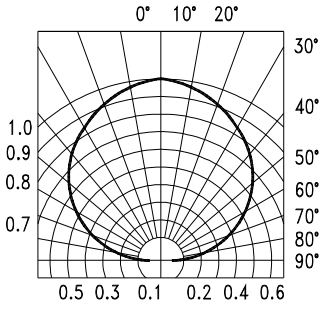


Fig.6 Spatial Distribution

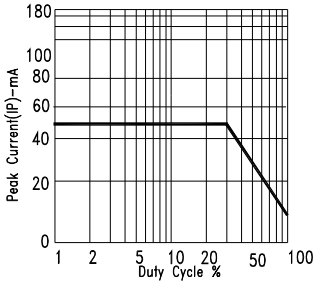
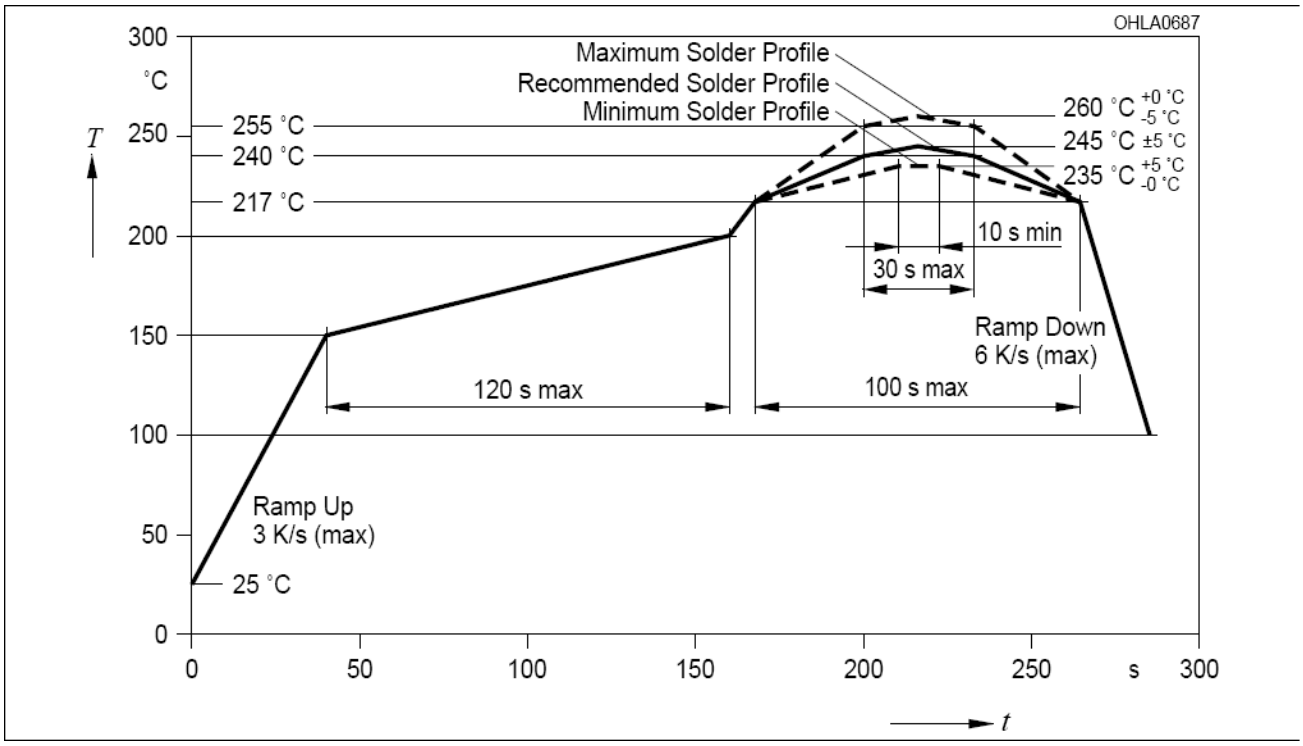


Fig.7 MAX. PEAK CURRENT VS. DUTY CYCLE % (REFRESH RATE 1KHz)

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)



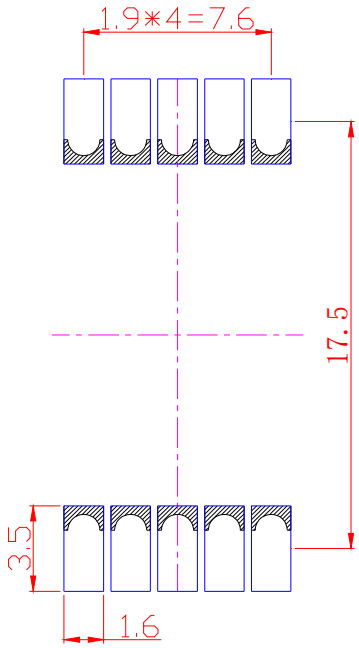
Notes :

1. Recommended soldering condition

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

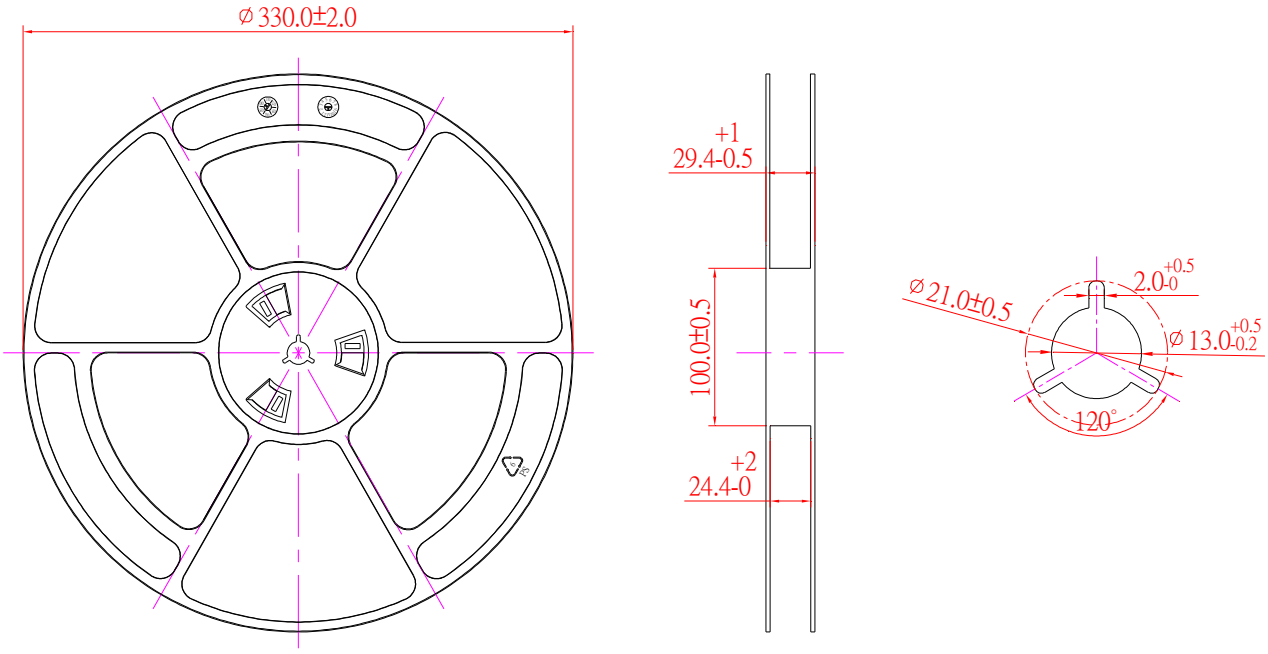
2. Number of reflow process shall be less than 2 times, and cooling process to normal temperature is required between the first and the second soldering process.

7. Recommended Soldering Pattern

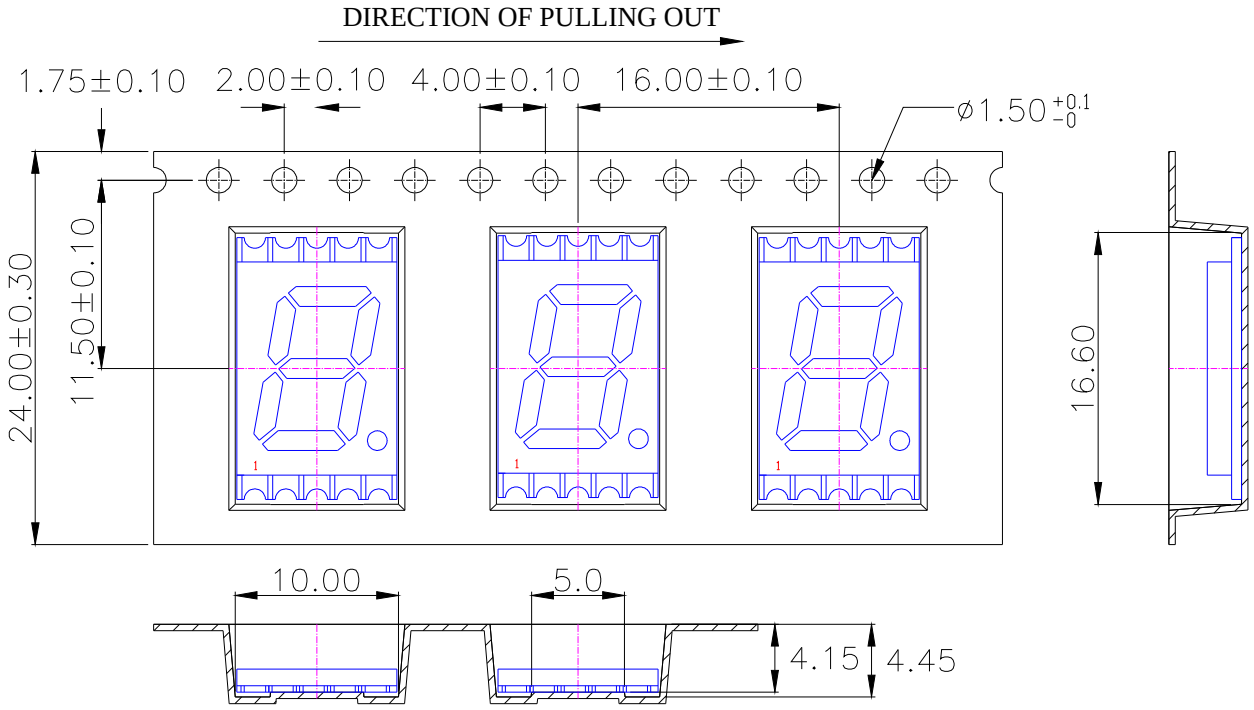


8. Packing Specification

8.1. Packing Reel Dimensions

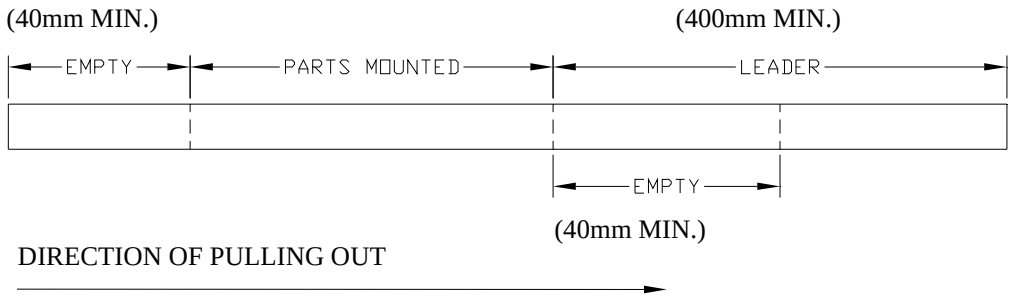


8.2. Packing Carrier Dimensions



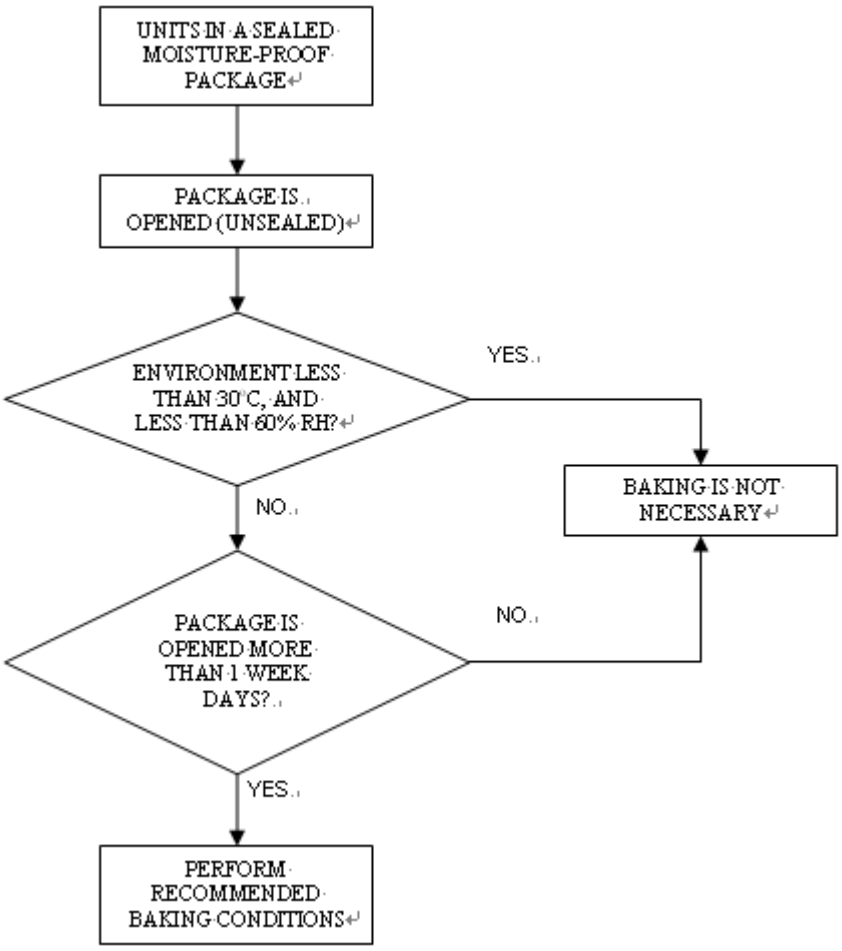
1. 10 sprocket hole pitch cumulative tolerance ±0.20.
2. Carrier camber is within 1 mm in 250 mm.
3. All dimensions meet EIA-481-C requirements.
4. Thickness : 0.40±0.05mm.
5. Packing length per 22" reel : 45.50 Meters.
6. Component load per 13" reel : 800 pcs.
7. Minimum packing quantity is 200 pcs 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℃ or less and60 % 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