



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 (For ELMARC Only)

Rev	<u>Description</u>	Ву	<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		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				
	Above data for PD and Customer tracking only						
-	NPPR Received and Upload on System	Reo Lin	02/26/2013				
Α	Update Packing spec. in page 11	Reo Lin	01/31/2020				

Part No. : LTD-3812SW-P BNS-OD-FC002/A4



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

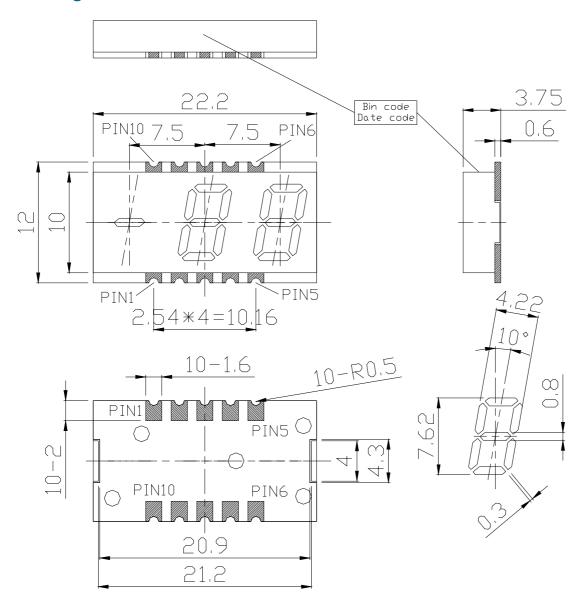
- 0.3 inch (7.62 mm) DIGIT HEIGHT
- CONTINUOUS UNIFORM SEGMENTS
- LOW POWER REQUIREMENT
- EXCELLENT CHARACTERS APPEARANCE
- HIGH BRIGHTNESS & HIGH CONTRAST
- WIDE VIEWING ANGLE
- SOLID STATE RELIABILITY
- CATEGORIZED FOR LUMINOUS INTENSITY.
- LEAD-FREE PACKAGE(ACCORDING TO ROHS)

1.2 Device

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



2. Package Dimensions

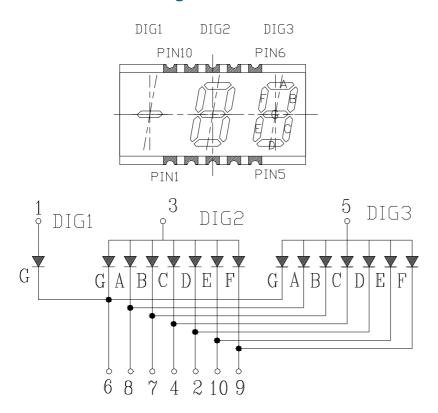


Notes:

- 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) \leq 20mils
- 4. Bubble in segment ≤10mil
- 5. Bending \leq 1% of reflector length
- 6. Plastic pin's burr max is 0.1 mm



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



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	10	mA
Derating Linear From 25℃ Per Segment	0.11	mA/℃
Operating Temperature Range	-35℃ to +105℃	
Storage Temperature Range	-35℃ to +105℃	
	1	

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 2
Chromaticity Coordinates	у		0.286		nm	
Forward Voltage Per Chip	VF	2.7		3.2	V	IF=5mA
Reverse Current Per Chip ⁽⁴⁾	IR			100	μΑ	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 $\, \leq \, 2.5\%$



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			
VF BIII	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			
IV BIII	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		

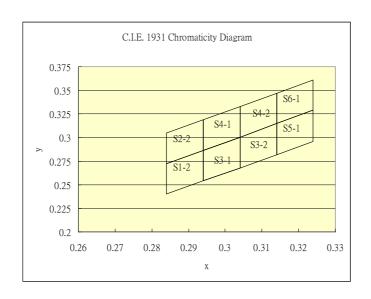
Tolerance on each Luminous Intensity bin is +/- 15%.



Hue Spec. Table

Uua Din	Color bin limits at IF = 5mA						
Hue Bin	CIE 1931Chromaticity coordinates						
S1-2	х	0.284	0.284	0.294	0.294		
31-2	у	0.240	0.272	0.286	0.254		
S2-2	х	0.284	0.284	0.294	0.294		
32-2	у	0.272	0.305	0.319	0.286		
S3-1	х	0.294	0.294	0.304	0.304		
33-1	у	0.254	0.286	0.300	0.268		
S3-2	х	0.304	0.304	0.314	0.314		
33-2	у	0.268	0.300	0.315	0.282		
S4-1	х	0.294	0.294	0.304	0.304		
34-1	у	0.286	0.319	0.333	0.300		
S4-2	х	0.304	0.304	0.314	0.314		
34-2	у	0.300	0.333	0.347	0.315		
S5-1	х	0.314	0.314	0.324	0.324		
30-1	у	0.282	0.315	0.329	0.296		
S6-1	х	0.314	0.314	0.324	0.324		
30-1	у	0.315	0.347	0.361	0.329		

Tolerance on each Hue (x, y) bin is \pm -0.01.





5.5. Typical Electrical / Optical Characteristics Curves

(25℃ Ambient Temperature Unless Otherwise Noted)

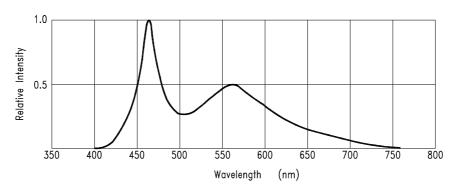
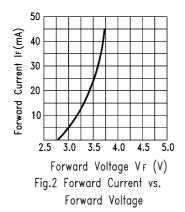
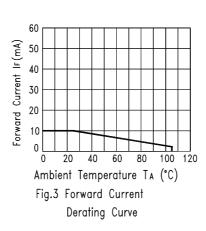
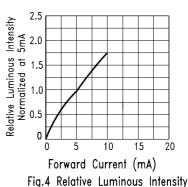
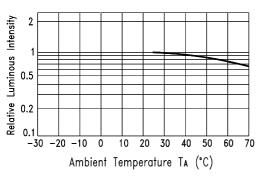


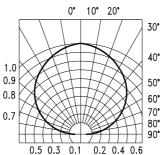
Fig.1 RELATIVE INTENSITY VS. WAVELENGTH

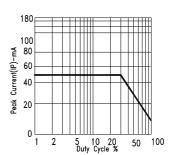












vs. Forward Current

Fig.5 Luminous Intensity vs.

Ambient Temperature

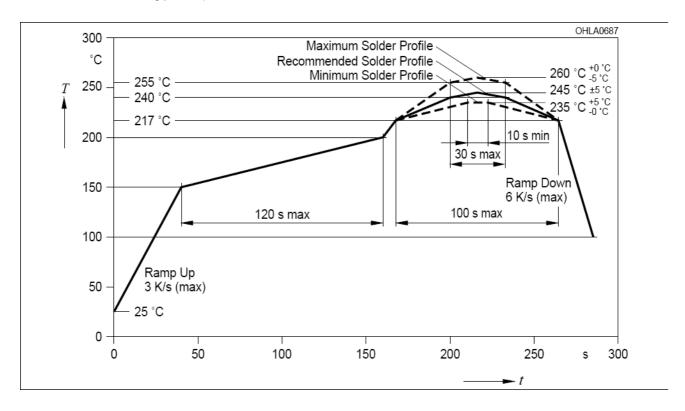
Fig.6 Spatial Distribution

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 tin	nes 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℃ Max.			
Soldering time:	5sec. Max.			

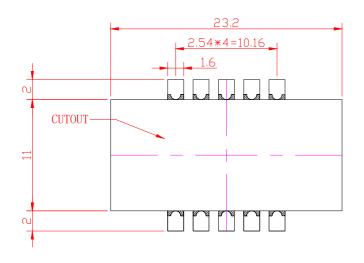
2. Number of reflow process shall be less than 2 times, and cooling process to normal temperature is required between the first and the second soldering process.

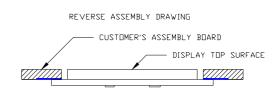
Part No.: LTD-3812SW-P BNS-OD-FC002/A4





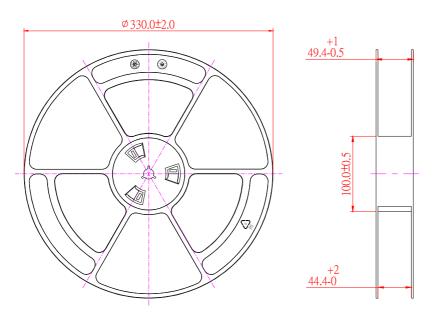
7. Recommended Soldering Pattern

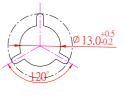




8. Packing Specification

8.1. Packing Reel Dimensions

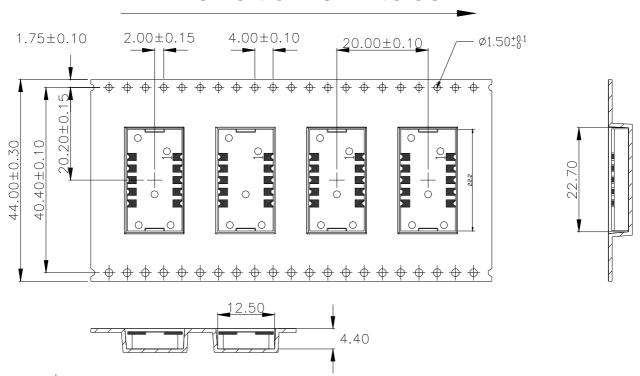






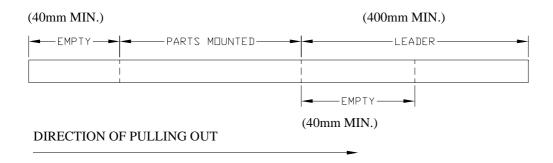
8.2. Packing Carrier Dimensions

DIRECTION OF PULLING OUT



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

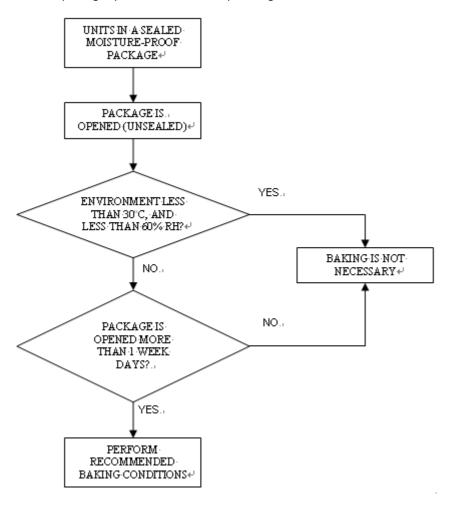
8.3. Trailer part / Leader part





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° K 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
III DUIK	125°C	≧2hours