

LED Display
Product Data Sheet
LTD-4601G-04

Spec No. :DS30-2001-259
Effective Date: 11/09/2018
Revision: A

LITE-ON DCC

RELEASE

BNS-OD-FC001/A4

LED DISPLAY LTD-4601G-04

LED DISPLAY

LTD-4601G-04

<u>Rev</u>	<u>Description</u>	<u>By</u>	<u>Date</u> <u>DD/MM/YYYY</u>
01	Preliminary SPEC	Eric Wu	07/27/2001
Above data for PD and Customer tracking only			
-	NPPR Received and Upload to system	Eric Wu	07/27/2001
A	Update to new form DS, Add packing spec, Add dimension for DP, Correct Digit shape, Change Luminous Intensity Matching Ratio to 1.8:1, Revise Solder Condition from 3 second to within 5 second at 260'C, Manual solder change to 5 second at 260'C (not over 380'C max), Add Reliability Test and Soldering Profile, Need only BIN J,K,L	Chrisada P.	03/10/2018

LED DISPLAY LTD-4601G-04

1. Description

The LTD-4601G-04 is a 0.4 inch (10.21 mm) digit height dual digit seven-segment display. This device utilizes green LED chips, which are made from GaP on a transparent GaP substrate, and has a gray face and white segments.

1.1 Features

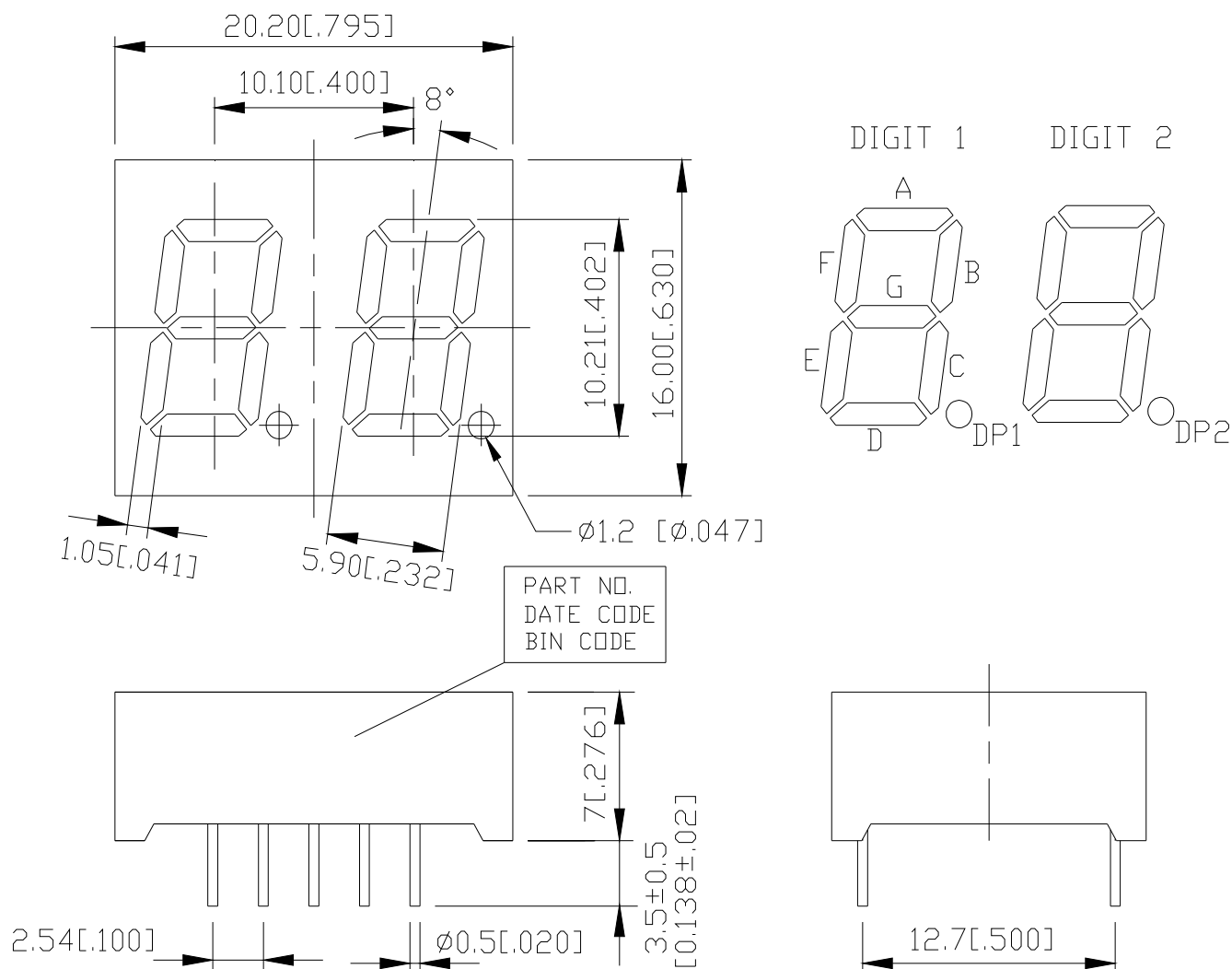
- 0.4 inch (10.21 mm) DIGIT HEIGHT
- CONTINUOUS UNIFORM SEGMENTS
- LOW POWER REQUIREMENT
- EXCELLENT CHARACTERS APPEARANCE
- HIGH BRIGHTNESS & HIGH CONTRAST
- WIDE VIEWING ANGLE
- SOLID STATE RELIABILITY
- CATEGORIZED FOR LUMINOUS INTENSITY
- LEAD-FREE PACKAGE (ACCORDING TO ROHS)

1.2 Device

Part No	Description
GREEN	Duplex Common Anode
LTD-4601G-04	Rt. Hand Decimal

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2. Package Dimensions

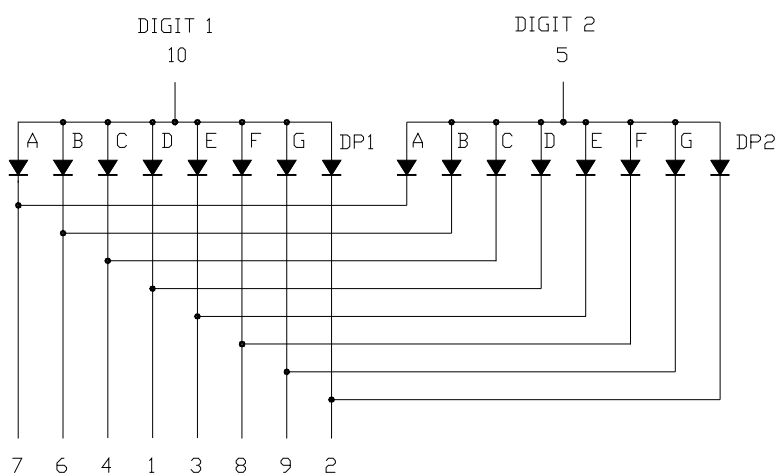


NOTES:

1. All dimensions are in millimeters. Tolerances are ± 0.25 mm (0.01") unless otherwise noted.
2. Pin tip's shift tolerance is ± 0.4 mm.
3. Recommend the best PCB hole: $\phi 1.0$ mm.
4. Foreign material on segment ≤ 10 mils.
5. Ink contamination (surface) ≤ 20 mils.
6. Bending $\leq 1/100$.
7. Bubble in segment ≤ 10 mils.

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3. Internal Circuit Diagram



4. Pin Connection

No.	CONNECTION
1	CATHODE D
2	CATHODE D.P.1 & D.P.2
3	CATHODE E
4	CATHODE C
5	COMMON ANODE (DIGIT 2)
6	CATHODE B
7	CATHODE A
8	CATHODE F
9	CATHODE G
10	COMMON ANODE (DIGIT 1)

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5. Rating and Characteristics

5.1. Absolute Maximum Rating at Ta=25°C

Parameter	Maximum Rating	Unit
Power Dissipation Per Segment	75	mW
Peak Forward Current Per Segment (1/10 Duty Cycle, 0.1ms Pulse Width)	100	mA
Continuous Forward Current Per Segment	25	mA
Derating Linear From 25°C Per Segment	0.28	mA/°C
Operating Temperature Range	-35°C to +105°C	
Storage Temperature Range	-35°C to +105°C	
Solder Condition: 1/16 inch below seating plane for within 5 second at 260°C or temperature of unit (during assembly) not over max. temperature rating above.		

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

Parameter	Symbol	MIN.	TYP.	MAX.	Unit	Test Condition
Average Luminous Intensity	IV	1301	2200	5400	μcd	IF=10mA
Average Luminous Intensity Per DP	IV	126	201			
Peak Emission Wavelength	λp		565		nm	IF=20mA
Spectral Line Half-Width	Δλ		30		nm	IF=20mA
Dominant Wavelength	λd		569		nm	IF=20mA
Forward Voltage Per Segment	VF		2.1	2.6	V	IF=20mA
Reverse Current Per Segment	IR			100	μA	VR=5V
Luminous Intensity Matching Ratio	IV-m			1.8:1		IF=10mA

Notes :

- Luminous intensity is measured with a light sensor and filter combination that approximates the CIE (Commission International De L'Eclairage) eye-response curve.
- Reverse voltage is only for IR test. It cannot continue to operate at this situation.
- Cross talk specification ≤ 2.5%.

BIN GRADE	J	K	L
RANGE (Ucd) IF=10mA	1301-2100	2101-3400	3401-5400

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5.3. Typical Electrical / Optical Characteristics Curves

(25°C Ambient Temperature Unless Otherwise Noted)

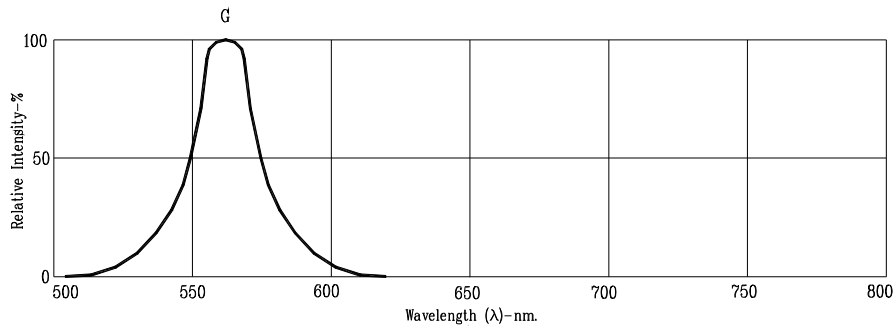


Fig1. RELATIVE INTENSITY VS. WAVELENGTH

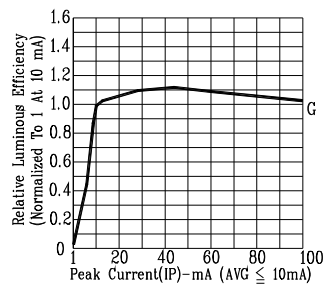


Fig2. RELATIVE LUMINOUS EFFICIENCY (LUMINOUS INTENSITY PER UNIT CURRENT) VS. PEAK CURRENT (REFRESH RATE 1KHz)

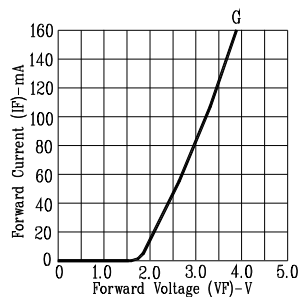


Fig3. FORWARD CURRENT VS. FORWARD VOLTAGE

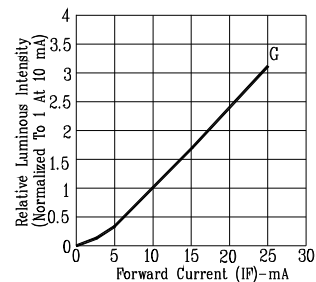


Fig4. RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT

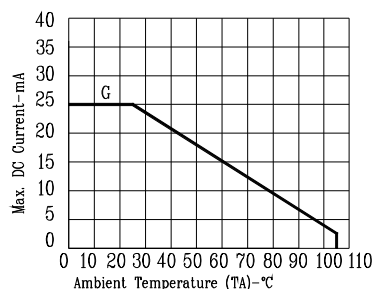


Fig5. MAX. ALLOWABLE DC CURRENT VS. AMBIENT TEMPERATURE.

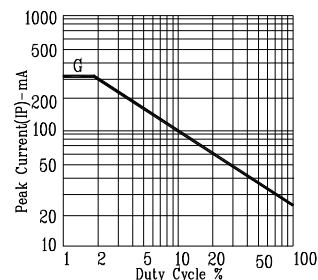


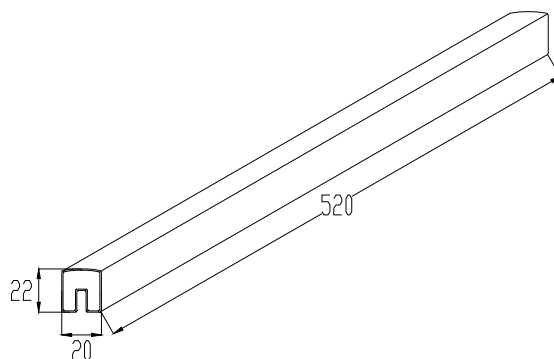
Fig6. MAX. PEAK CURRENT VS. DUTY CYCLE % (REFRESH RATE 1KHz)

NOTE: G=GREEN

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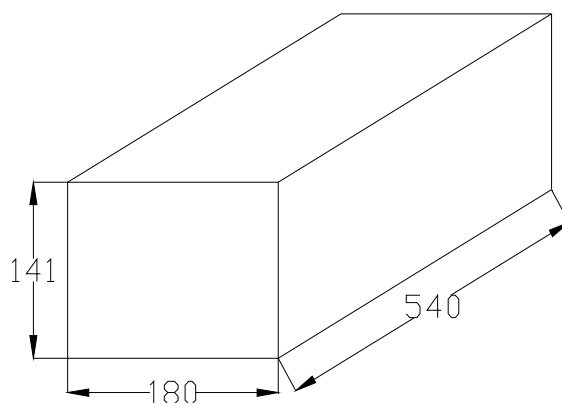
6. Packing Spec

Unit/Tube: 25



Tube/Inner Carton: 40

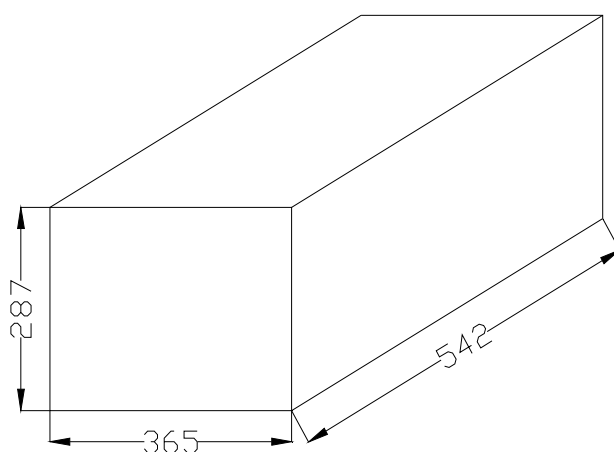
Unit/Inner Carton: 1000



Inner Carton/Outer Carton: 4

Tube/Outer Carton: 160

Unit/Outer Carton: 4000



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7. Reliability Test

Classification	Test Item		Test Condition	Reference Standard
Endurance Test	Operation Life	RTOL	Ta=Under Room Temperature IF=As per data sheet maximum Rating * Test Time= 1000Hrs (-24Hrs, +72Hrs)	MIL-STD-750D:1026 (1995) MIL-STD-883E:1005 (1996) JIS C 7021: B-1 (1982)
	High Temperature High Humidity Storage	THS	Ta= 65±5°C RH=90 ~ 95% Test Time=500Hrs (±2Hrs)	MIL-STD-202G:103B (2002) JIS C 7021: B-11 (1982)
	High Temperature Storage	HTS	Ta= 105±5°C Test Time=1000Hrs (-24Hrs, +72Hrs)	MIL-STD-883E:1008 (1996) JIS C 7021: B-10 (1982)
	Low Temperature Storage	LTS	Ta= -35±5°C Test Time=1000Hrs (-24Hrs, +72Hrs)	JIS C 7021: B-12 (1982)
Environmental Test	Temperture Cycling	TC	105°C ~ 25°C ~ -35°C ~ 25°C 30mins ~ 5mins ~ 30mins ~ 5mins 30 Cycles	MIL-STD-202G:107D (2002) MIL-STD-750D:1051 (1995) MIL-STD-883E:1010 (1996) JIS C 7021: A-4 (1982)
	Thermal Shock	TS	105 ±5°C ~ -35 ±5°C 30mins ~ 30mins 30 Cycles	MIL-STD-202G:107D (2002) MIL-STD-750D:1051 (1995) MIL-STD-883E:1011 (1996)
	Solder Resistance	SR	T.Sol=260 ±5°C Dwell Time= 10 ±1 secs (For solder pin only)	MIL-STD-202G:210A (2002) MIL-STD-750D:2031 (1995) JIS C 7021: A-1 (1982)
	Solderability	SA	T.Sol=245 ±5°C Dwell Time= 5 ±1 secs (For solder pin only)	MIL-STD-202G:208D (2002) MIL-STD-750D:2026 (1995) MIL-STD-883E:2003 (1996) JIS C 7021: A-2 (1982)

* (Check point: 0th, 168th, 500th, 800th, 1000th Hrs)

Follow as : QS-00TP-RELBE-0001 Reliability Test Conditions

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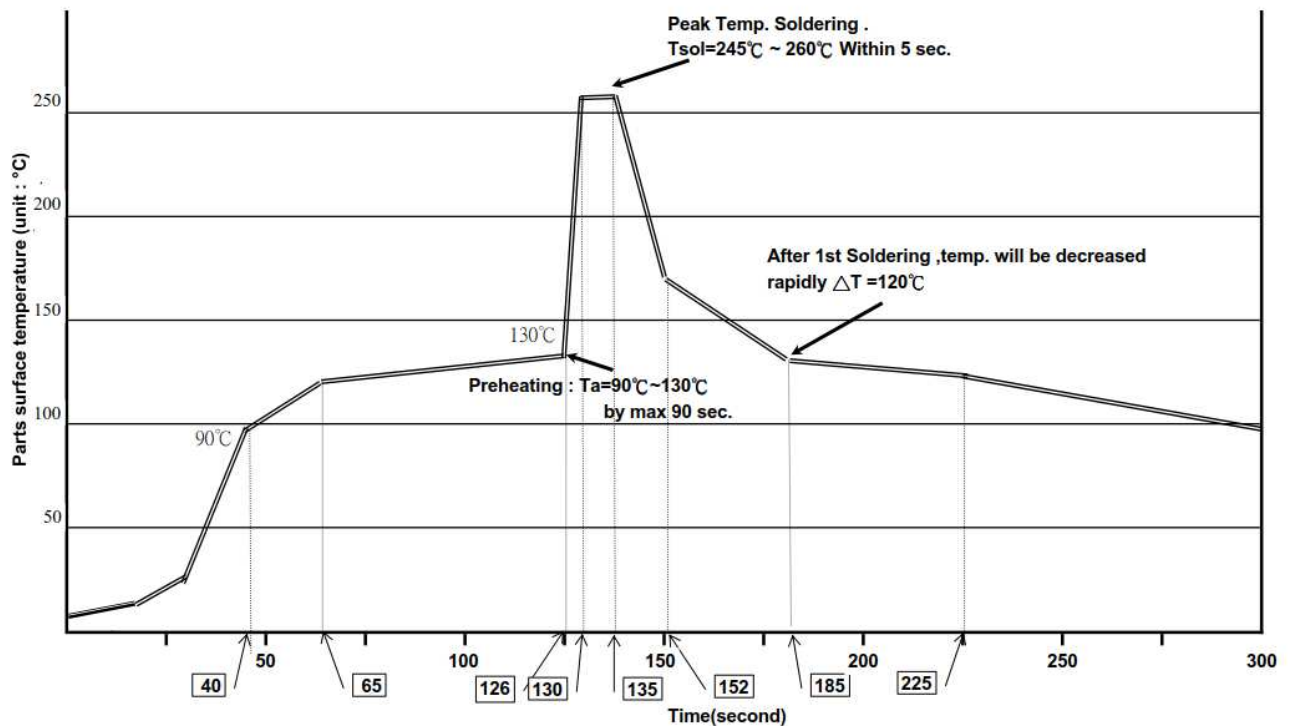
8. Soldering Profile

8.1 Auto Soldering



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** Flow(=Wave soldering) condition with temperature for Pb free Soldering



8.2 Manual Soldering

Solder Conditions: 1/16 inch below seating plane for within 5 seconds at 350°C (not over 380°C max) , or temperature of unit (during assembly) not over max. Temperature rating above.