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DUAL DIGIT LED DISPLAY (0.56 Inch)



Lead-Free Parts

## LDD511/2DBK-XX/A

# DATA SHEET

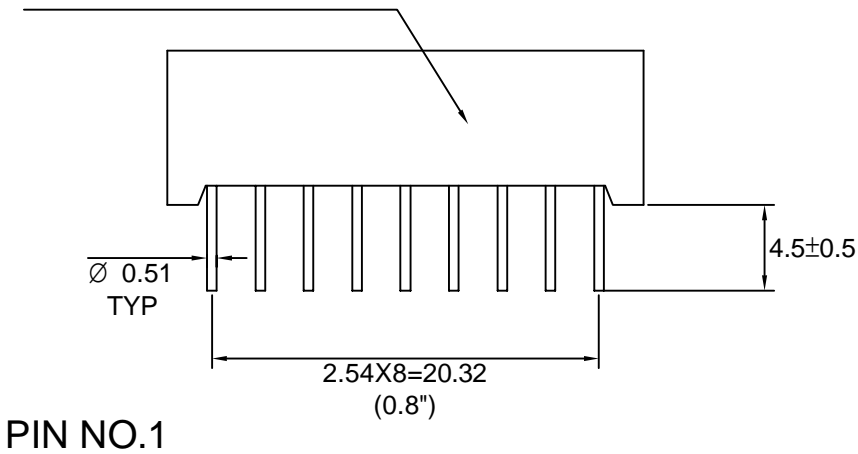
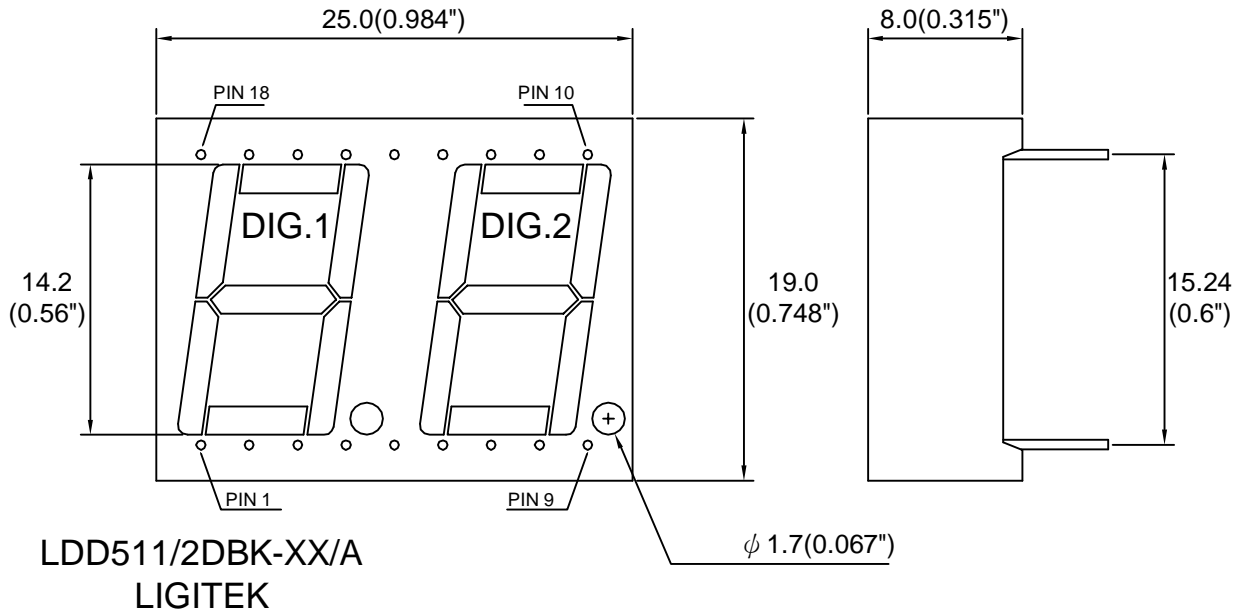
DOC. NO : QW0905-LDD511/2DBK-XX/A

REV. : A

DATE : 01 - Aug. - 2013



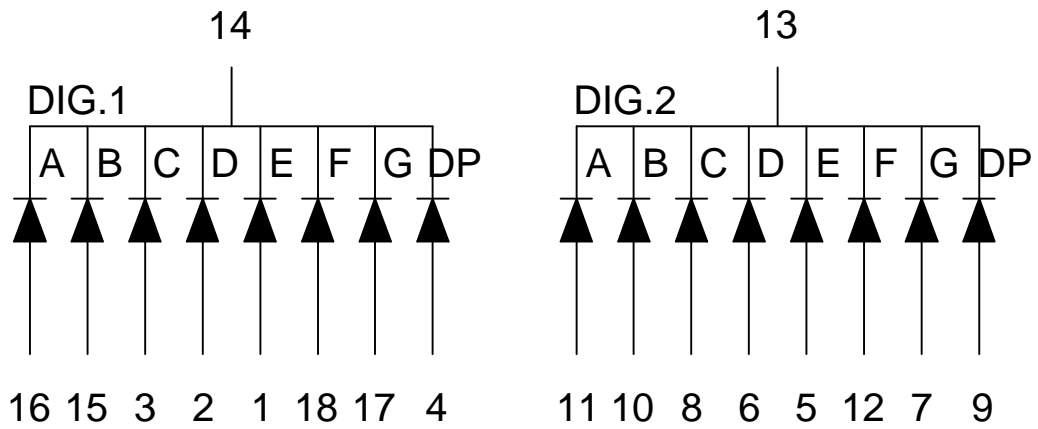
Package Dimensions



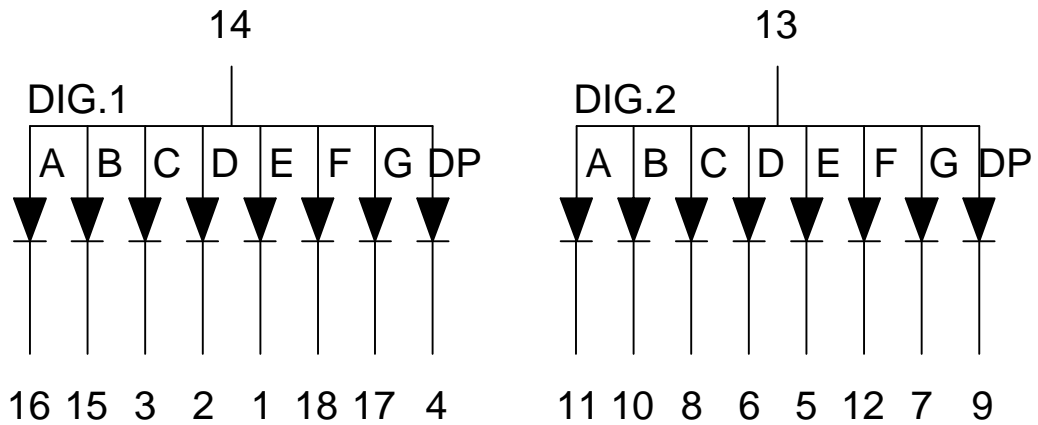
Note : 1.All dimension are in millimeters and (Inch) tolerance is  $\pm 0.25\text{mm}$  unless otherwise noted.  
2.Specifications are subject to change without notice.

Internal Circuit Diagram

**LDD511DBK-XX/A**



**LDD512DBK-XX/A**



## Electrical Connection

PIN NO.	LDD511DBK-XX/A	PIN NO.	LDD512DBK-XX/A
1	Anode E Dig.1	1	Cathode E Dig.1
2	Anode D Dig.1	2	Cathode D Dig.1
3	Anode C Dig.1	3	Cathode C Dig.1
4	Anode DP Dig.1	4	Cathode DP Dig.1
5	Anode E Dig.2	5	Cathode E Dig.2
6	Anode D Dig.2	6	Cathode D Dig.2
7	Anode G Dig.2	7	Cathode G Dig.2
8	Anode C Dig.2	8	Cathode C Dig.2
9	Anode DP Dig.2	9	Cathode DP Dig.2
10	Anode B Dig.2	10	Cathode B Dig.2
11	Anode A Dig.2	11	Cathode A Dig.2
12	Anode F Dig.2	12	Cathode F Dig.2
13	Common Cathode Dig.2	13	Common Anode Dig.2
14	Common Cathode Dig.1	14	Common Anode Dig.1
15	Anode B Dig.1	15	Cathode B Dig.1
16	Anode A Dig.1	16	Cathode A Dig.1
17	Anode G Dig.1	17	Cathode G Dig.1
18	Anode F Dig.1	18	Cathode F Dig.1

### Absolute Maximum Ratings at Ta=25 °C

Parameter	Symbol	Ratings	UNIT
		DBK	
Forward Current Per Chip	IF	30	mA
Peak Forward Current Per Chip (Duty 1/10,0.1ms Pulse Width)	IFP	100	mA
Power Dissipation Per Chip	PD	120	mW
Reverse Current Per Any Chip	Ir	50	μA
Electrostatic Discharge( * )	ESD	500	V
Operating Temperature	Topr	-25 ~ +85	°C
Storage Temperature	Tstg	-25 ~ +85	°C

\* Static Electricity or power surge will damage the LED. Use of a conductive wrist band or anti-electrostatic glove is recommended when handling these LED. All devices, equipment and machinery must be properly grounded.

### Part Selection And Application Information(Ratings at 25°C)

PART NO	CHIP		common cathode or anode	λ D (nm)	Δ λ (nm)	Electrical				IV-M
	Material	Emitted				Vf(v)		Iv(mcd)		
						Typ.	Max.	Min.	Typ.	
LDD511DBK-XX/A	InGaN	Blue	Common Cathode	470	30	3.5	4.0	18.0	26.0	2:1
LDD512DBK-XX/A			Common Anode							

Note : 1.The forward voltage data did not including ±0.1V testing tolerance.  
2. The luminous intensity data did not including ±15% testing tolerance.

## Brightness Code For Standard LED Display

Group	Luminous Intensity(mcd) at 10mA	
	Min	Max
U	18.0	21.5
V	21.5	26.0
W	26.0	31.0
X	31.0	37.0
Y	37.0	43.0
Z	43.0	50.0
Z1	50.0	58.0
Z2	58.0	68.0

**Test Condition For Each Parameter**

Parameter	Symbol	Unit	Test Condition
Forward Voltage Per Chip	V <sub>f</sub>	volt	I <sub>f</sub> =20mA
Luminous Intensity Per Chip	I <sub>v</sub>	mcd	I <sub>f</sub> =10mA
Dominant Wavelength	$\lambda_D$	nm	I <sub>f</sub> =20mA
Spectral Line Half-Width	$\Delta \lambda$	nm	I <sub>f</sub> =20mA
Reverse Current Any Chip	I <sub>r</sub>	$\mu A$	V <sub>r</sub> =5V
Luminous Intensity Matching Ratio	IV-M		

## Typical Electro-Optical Characteristics Curve

### DBK CHIP

Fig.1 Forward current vs. Forward Voltage

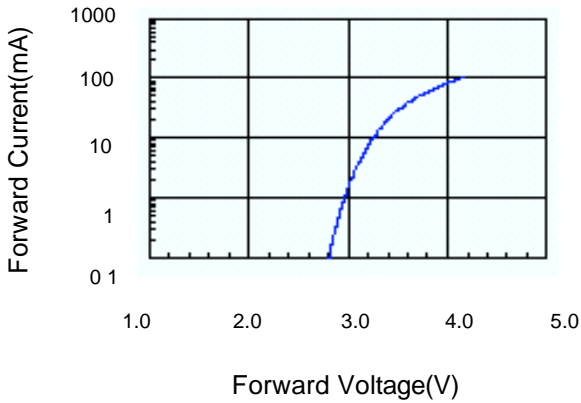


Fig.2 Relative Intensity vs. Forward Current

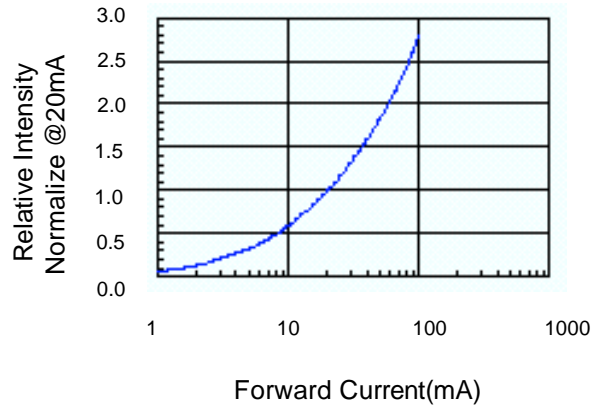


Fig.3 Forward Voltage vs. Temperature

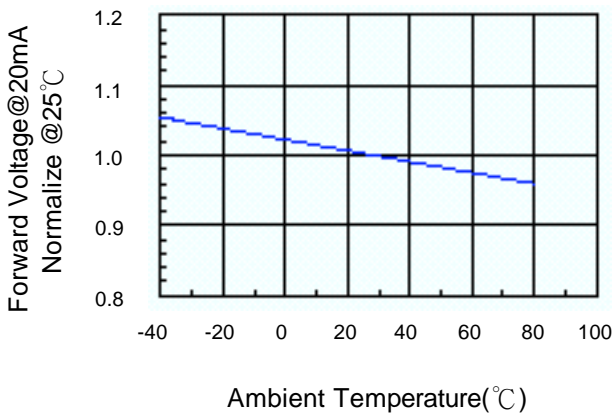


Fig.4 Relative Intensity vs. Temperature

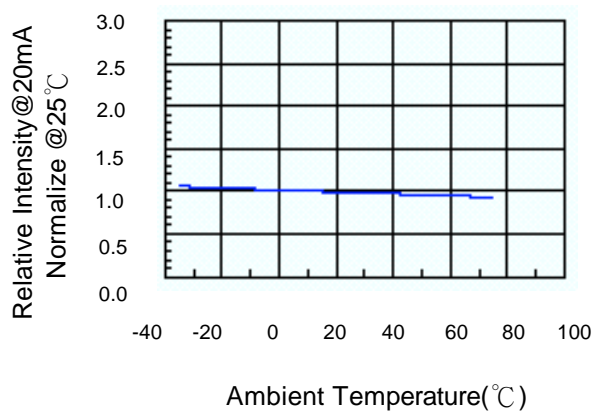
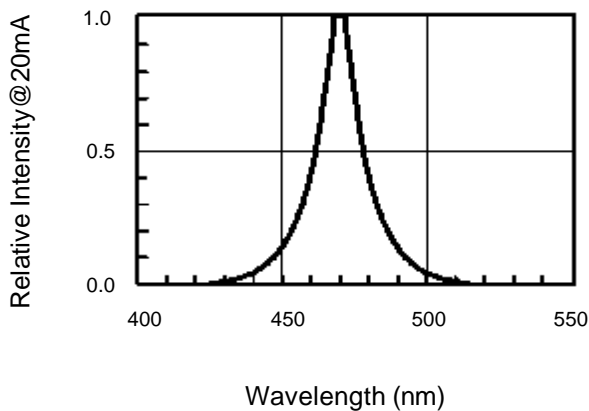


Fig.5 Relative Intensity vs. Wavelength



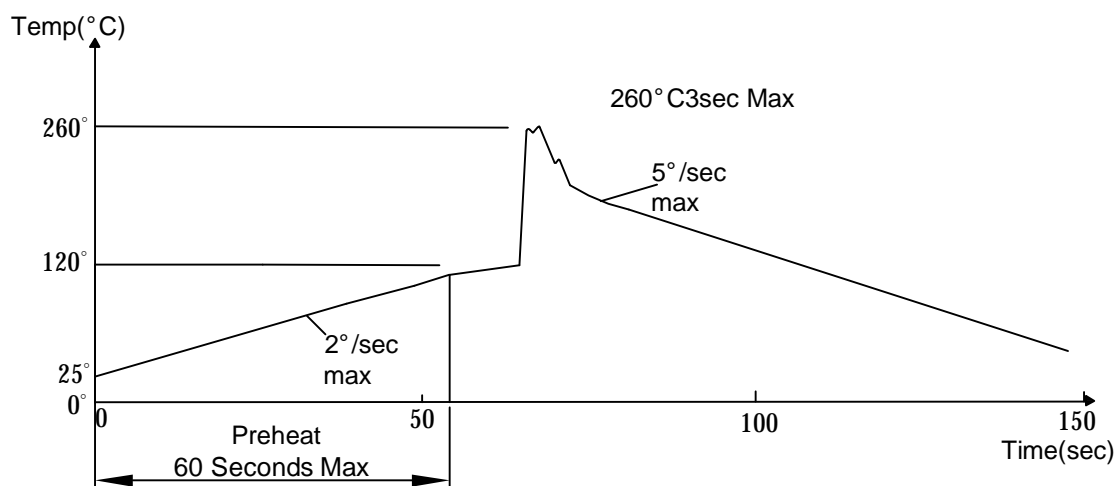


**Soldering Condition(Pb-Free)****1.Iron:**

Soldering Iron:30W Max  
Temperature 350 ° C Max  
Soldering Time:3 Seconds Max(One Time)  
Distance:Solder Temperature 1/16 Inch Below Seating  
Plane For 3 Seconds At 260 ° C

**2.Wave Soldering Profile**

Dip Soldering  
Preheat: 120° C Max  
Preheat time: 60seconds Max  
Ramp-up  
2° C/sec(max)  
Ramp-Down:-5° C/sec(max)  
Solder Bath:260° C Max  
Dipping Time:3 seconds Max  
Distance:Solder Temperature 1/16 Inch Below Seating  
Plane For 3 Seconds At 260° C



### Reliability Test:

Test Item	Test Condition	Description	Reference Standard
Operating Life Test	1.Under Room Temperature 2.If=10mA 3.t=1000 hrs (-24hrs, +72hrs)	This test is conducted for the purpose of determining the resistance of a part in electrical and thermal stressed.	MIL-STD-750: 1026 MIL-STD-883: 1005 JIS C 7021: B-1
High Temperature Storage Test	1.Ta=105°C±5°C 2.t=1000 hrs (-24hrs, +72hrs)	The purpose of this is the resistance of the device which is laid under condition of high temperature for hours.	MIL-STD-883:1008 JIS C 7021: B-10
Low Temperature Storage Test	1.Ta=-40°C±5°C 2.t=1000 hrs (-24hrs, +72hrs)	The purpose of this is the resistance of the device which is laid under condition of low temperature for hours.	JIS C 7021: B-12
High Temperature High Humidity Test	1.Ta=65°C±5°C 2.RH=90%~95% 3.t=240hrs±2hrs	The purpose of this test is the resistance of the device under tropical for hours.	MIL-STD-202:103B JIS C 7021: B-11
Thermal Shock Test	1.Ta=105°C±5°C & -40°C±5°C (10min) (10min) 2.total 10 cycles	The purpose of this is the resistance of the device to sudden extreme changes in high and low temperature.	MIL-STD-202: 107D MIL-STD-750: 1051 MIL-STD-883: 1011
Solder Resistance Test	1.T.Sol=260°C±5°C 2.Dwell time= 10 ±1sec.	This test intended to determine the thermal characteristic resistance of the device to sudden exposures at extreme changes in temperature when soldering the lead wire.	MIL-STD-202: 210A MIL-STD-750: 2031 JIS C 7021: A-1
Solderability Test	1.T.Sol=245°C±5°C 2.Dwell time=5 ±1sec	This test intended to see soldering well performed or not.	MIL-STD-202: 208D MIL-STD-750: 2026 MIL-STD-883: 2003 JIS C 7021: A-2