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DUAL DIGIT LED DISPLAY (0.40 Inch)



Lead-Free Parts

**LDD405/61-XX-PF**

**DATA SHEET**

DOC. NO : QW0905-LDD405/61-XX-PF

REV. : A

DATE : 22 - Jun. - 2006



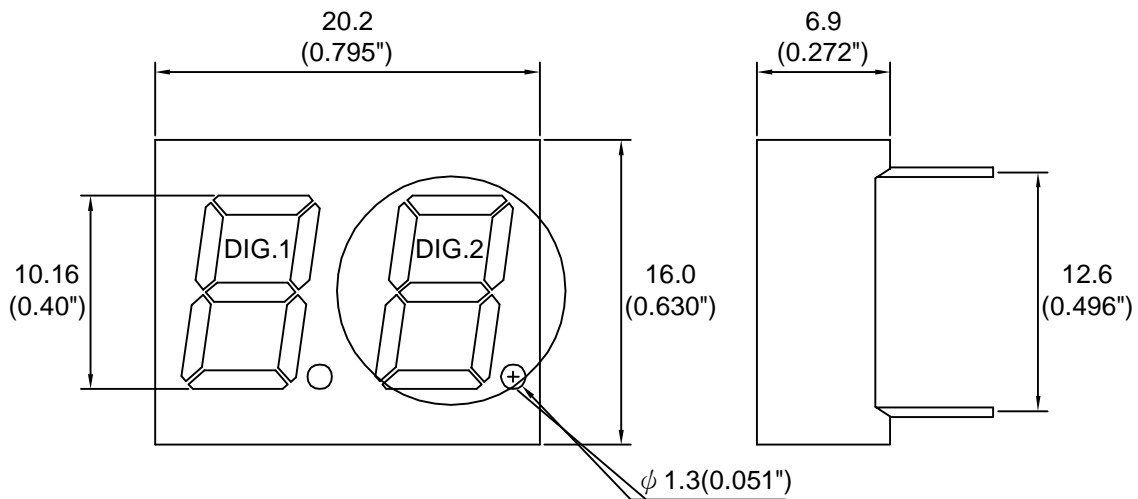
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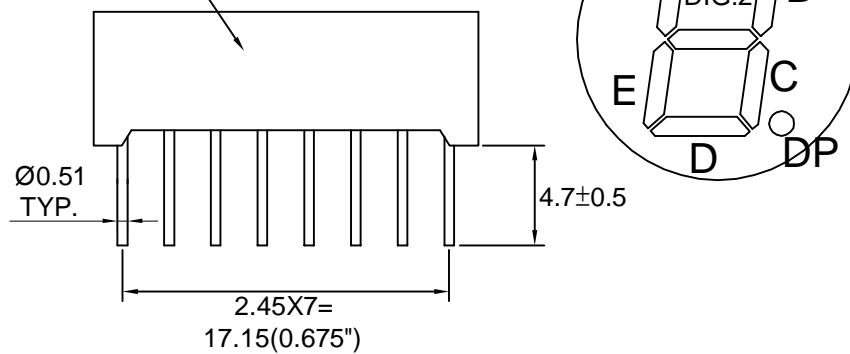
PART NO. LDD405/61-XX-PF

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### Package Dimensions



LDD405/61-XX-PF  
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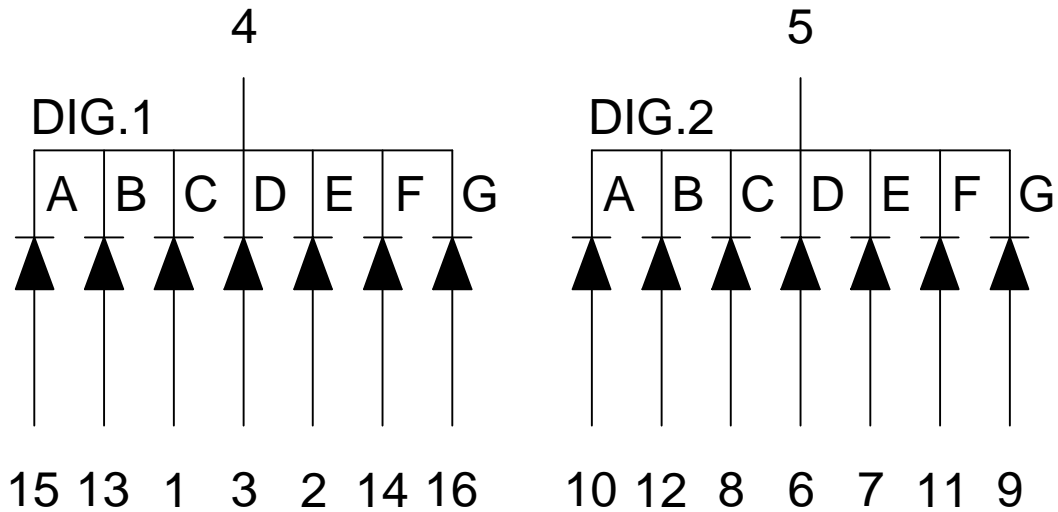
PIN NO.1 →

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.

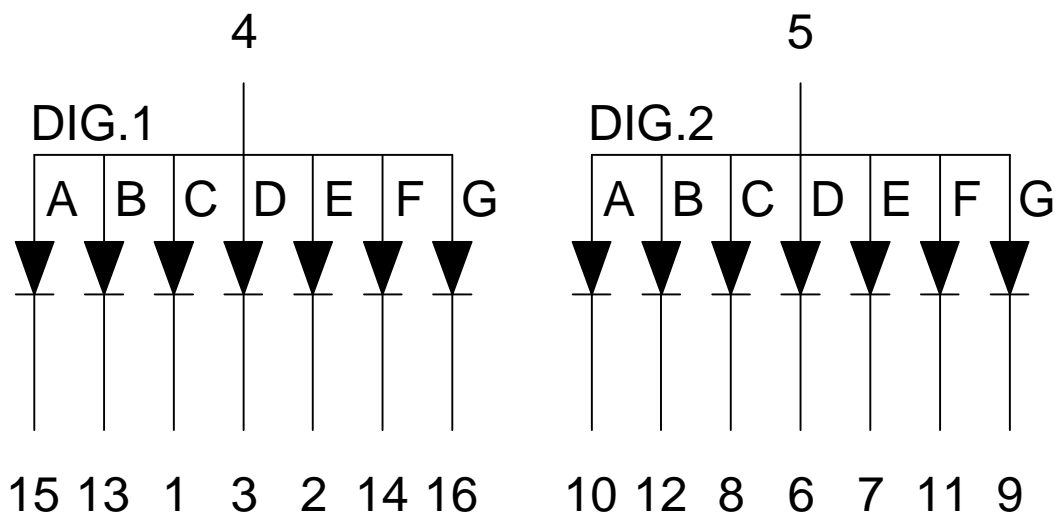


Internal Circuit Diagram

### LDD4051-XX-PF



### LDD4061-XX-PF



**Electrical Connection**

PIN NO.	LDD4051-XX-PF	PIN NO.	LDD4061-XX-PF
1	Anode C Dig.1	1	Cathode C Dig.1
2	Anode E Dig.1	2	Cathode E Dig.1
3	Anode D Dig.1	3	Cathode D Dig.1
4	Common Cathode Dig.1	4	Common Anode Dig.1
5	Common Cathode Dig.2	5	Common Anode Dig.2
6	Anode D Dig.2	6	Cathode D Dig.2
7	Anode E Dig.2	7	Cathode E Dig.2
8	Anode C Dig.2	8	Cathode C Dig.2
9	Anode G Dig.2	9	Cathode G Dig.2
10	Anode A Dig.2	10	Cathode A Dig.2
11	Anode F Dig.2	11	Cathode F Dig.2
12	Anode B Dig.2	12	Cathode B Dig.2
13	Anode B Dig.1	13	Cathode B Dig.1
14	Anode F Dig.1	14	Cathode F Dig.1
15	Anode A Dig.1	15	Cathode A Dig.1
16	Anode G Dig.1	16	Cathode G Dig.1



## Absolute Maximum Ratings at Ta=25 °C

Parameter	Symbol	Ratings	UNIT
		H	
Forward Current Per Chip	IF	15	mA
Peak Forward Current Per Chip (Duty 1/10,0.1ms Pulse Width)	IFP	60	mA
Power Dissipation Per Chip	PD	40	mW
Reverse Current Per Any Chip	Ir	10	μA
Operating Temperature	Topr	-25 ~ +85	°C
Storage Temperature	Tstg	-25 ~ +85	°C
Solder Temperature 1/16 Inch Below Seating Plane For 3 Seconds At 260 °C			

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

PART NO	CHIP		common cathode or anode	λ P (nm)	Δ λ (nm)	Electrical					IV-M
	Material	Emitted				Vf(v)			Iv(mcd)		
						Min.	Typ.	Max.	Min.	Typ.	
LDD4051-XX-PF	GaP	Red	Common Cathode	697	90	1.7	2.1	2.6	0.35	0.5	2:1
LDD4061-XX-PF			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.



### 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
Peak Wavelength	$\lambda P$	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

H CHIP

Fig.1 Forward current vs. Forward Voltage

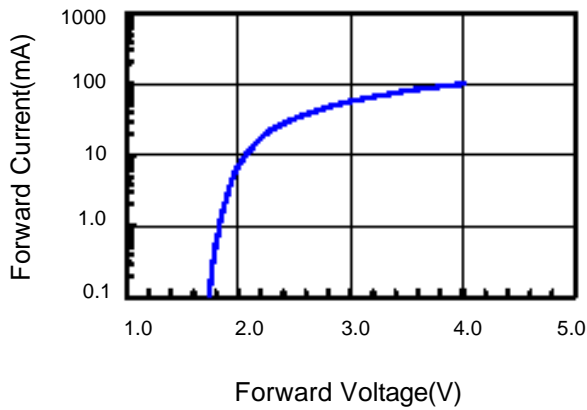


Fig.2 Relative Intensity vs. Forward Current

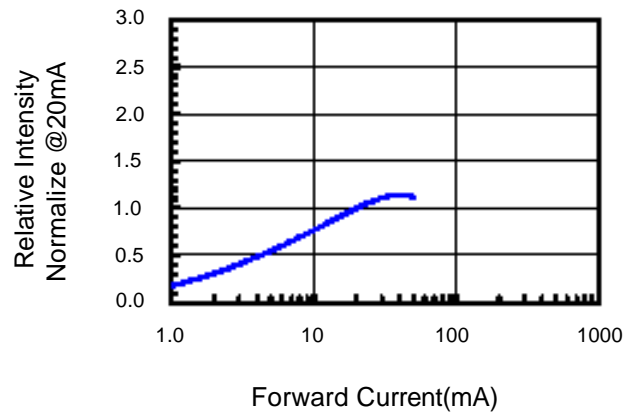


Fig.3 Forward Voltage vs. Temperature

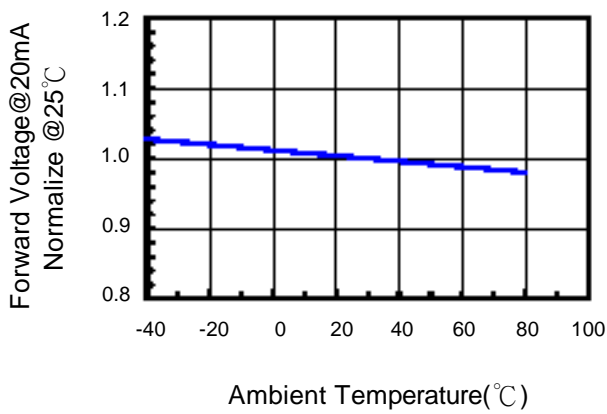


Fig.4 Relative Intensity vs. Temperature

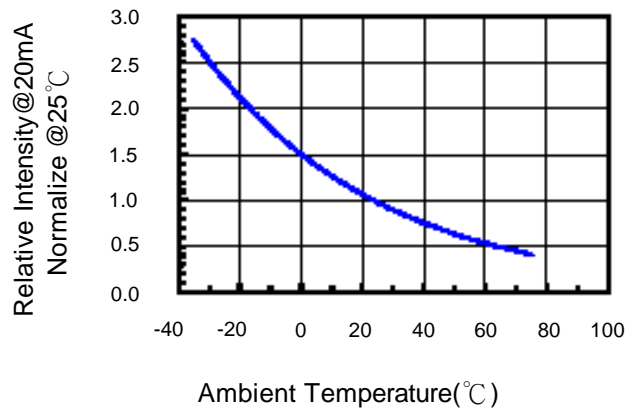
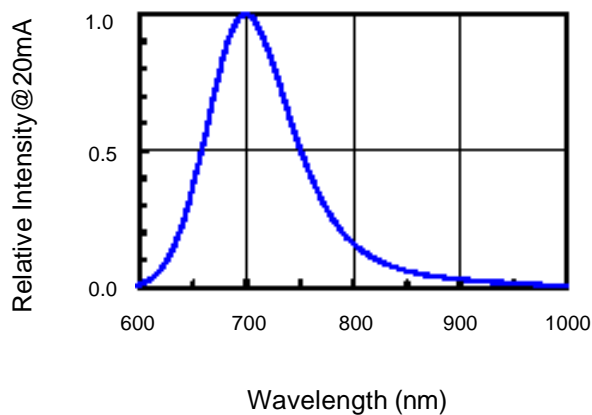


Fig.5 Relative Intensity vs. Wavelength





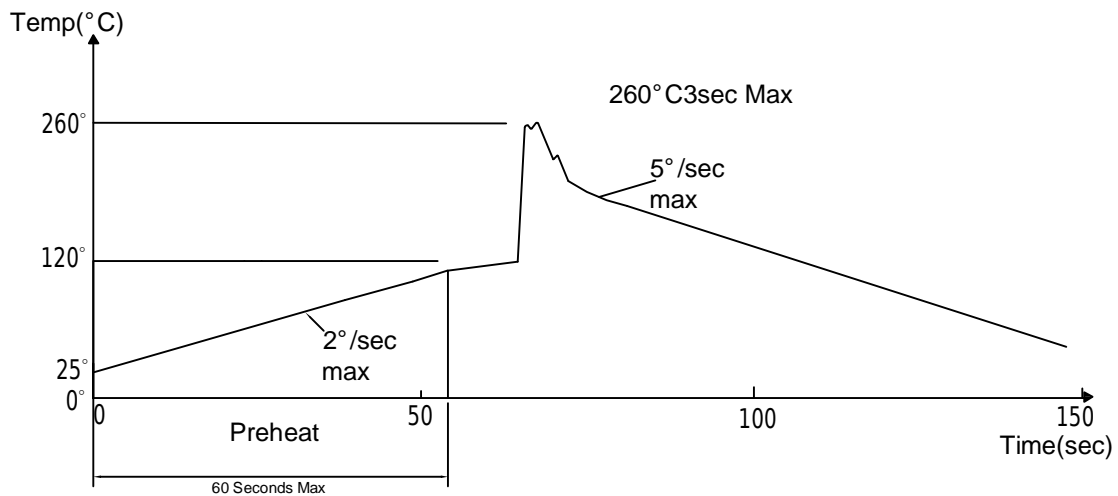
### Soldering Condition(Pb-Free)

#### 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=230 °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