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DUAL DIGIT LED DISPLAY (0.28 Inch)



Lead-Free Parts

**LDD205/64-XX-PF**

**DATA SHEET**

DOC. NO : QW0905-LDD205/64-XX-PF

REV. : B

DATE : 24 - Sep. - 2008



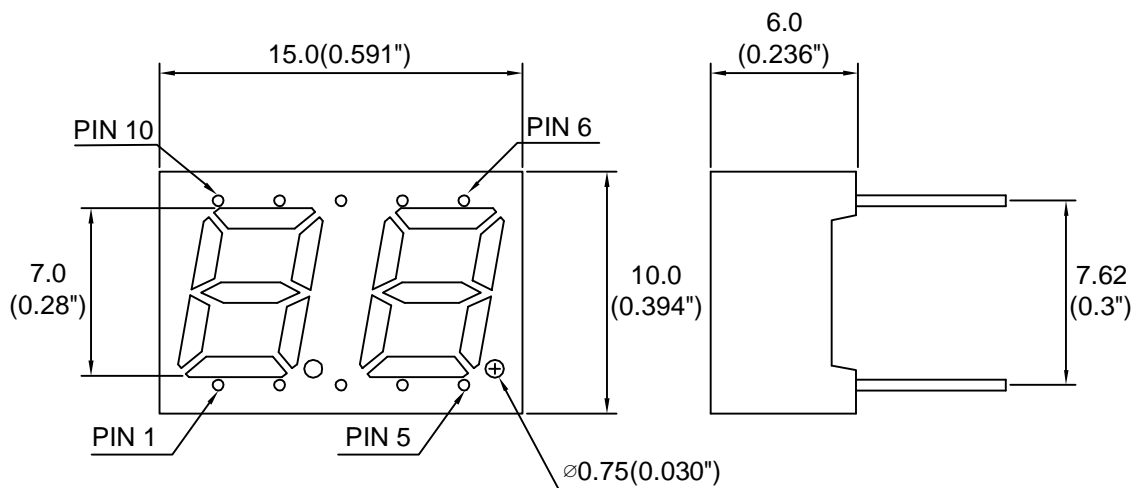
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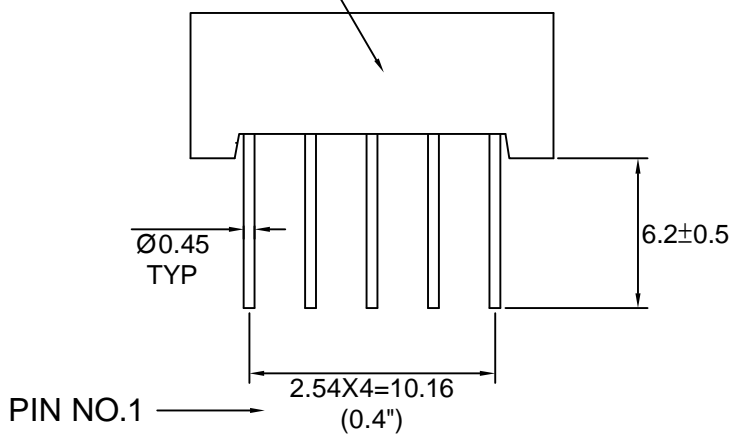
PART NO. LDD205/64-XX-PF

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### Package Dimensions



LDD205/64-XX-PF  
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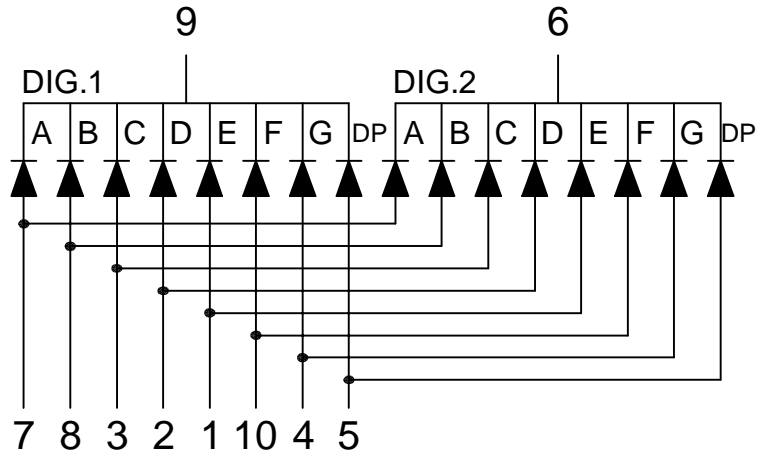


Note : 1.All dimension are in millimeters and (Inch) tolerance is  $\pm 0.25$ mm unless otherwise noted.  
2.Specifications are subject to change without notice.

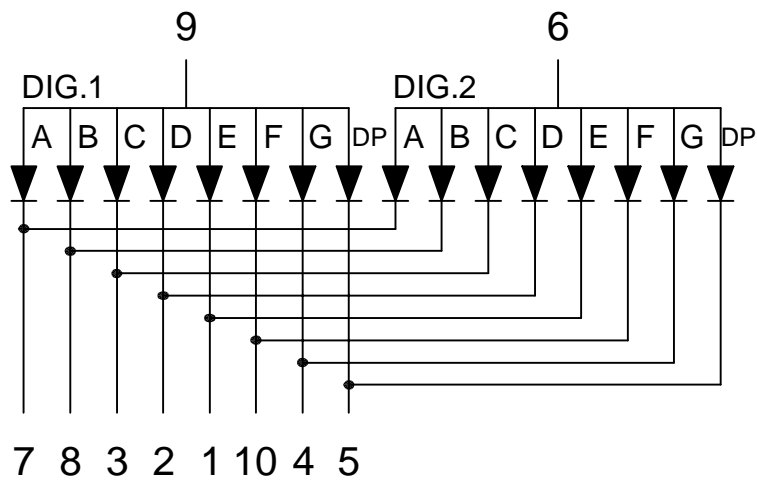


### Internal Circuit Diagram

#### LDD2054-XX-PF



#### LDD2064-XX-PF





Electrical Connection

| PIN NO. | LDD2054-XX-PF        | PIN NO. | LDD2064-XX-PF      |
|---------|----------------------|---------|--------------------|
| 1       | Anode E              | 1       | Cathode E          |
| 2       | Anode D              | 2       | Cathode D          |
| 3       | Anode C              | 3       | Cathode C          |
| 4       | Anode G              | 4       | Cathode G          |
| 5       | Anode DP             | 5       | Cathode DP         |
| 6       | Common Cathode Dig.2 | 6       | Common Anode Dig.2 |
| 7       | Anode A              | 7       | Cathode A          |
| 8       | Anode B              | 8       | Cathode B          |
| 9       | Common Cathode Dig.1 | 9       | Common Anode Dig.1 |
| 10      | Anode F              | 10      | Cathode F          |



Absolute Maximum Ratings at Ta=25 °C

| Parameter  | Symbol | Ratings   | UNIT |
|--|--------|-----------|------|
|  |        | E         |      |
| Forward Current Per Chip   | IF     | 30        | mA   |
| Peak Forward Current Per Chip (Duty 1/10,0.1ms Pulse Width)              | IFP    | 120       | mA   |
| Power Dissipation Per Chip   | PD     | 100       | 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. |      |
| LDD2054-XX-PF | GaAsP/GaP | Orange  | Common Cathode          | 635      | 45       | 1.7        | 2.1  | 2.6  | 0.5     | 1.0  | 2:1  |
| LDD2064-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          | Vf               | volt    | If=20mA        |
| Luminous Intensity Per Chip       | Iv               | mcd     | If=10mA        |
| Peak Wavelength                   | $\lambda P$      | nm      | If=20mA        |
| Spectral Line Half-Width          | $\Delta \lambda$ | nm      | If=20mA        |
| Reverse Current Any Chip          | Ir               | $\mu A$ | Vr=5V          |
| Luminous Intensity Matching Ratio | IV-M             |         |                |



### Typical Electro-Optical Characteristics Curve

E CHIP

Fig.1 Forward current vs. Forward Voltage

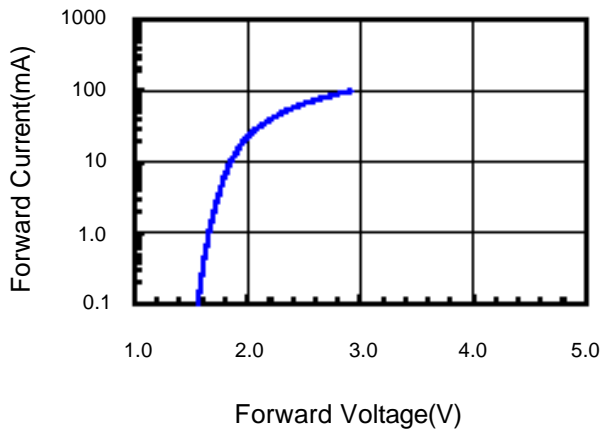


Fig.2 Relative Intensity vs. Forward Current

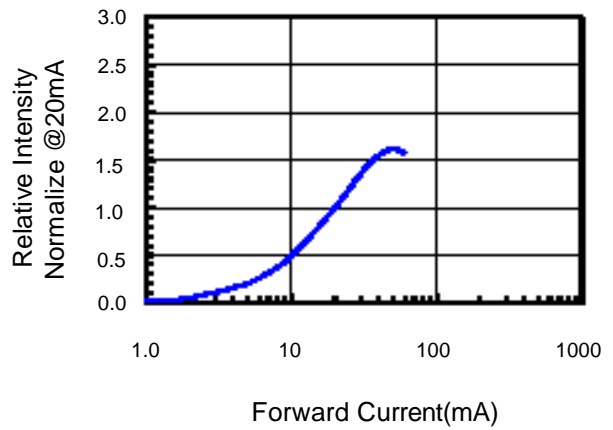


Fig.3 Forward Voltage vs. Temperature

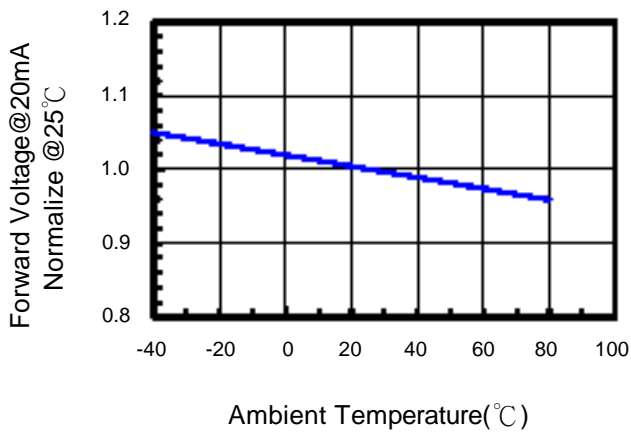


Fig.4 Relative Intensity vs. Temperature

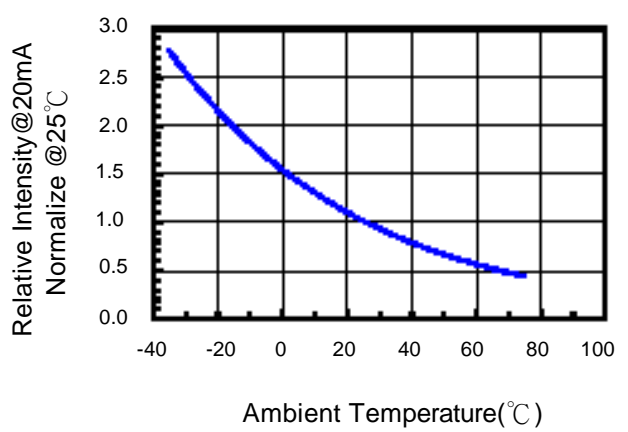
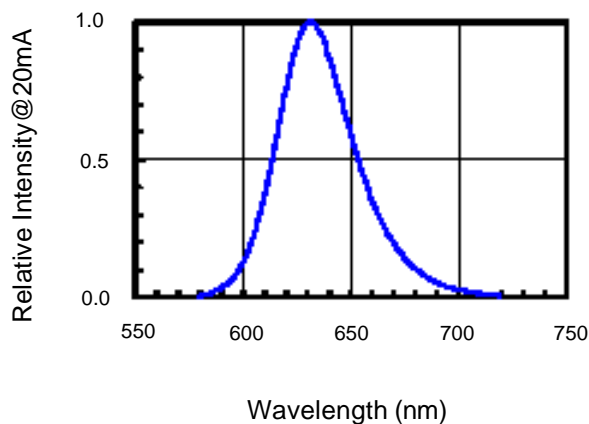


Fig.5 Relative Intensity vs. Wavelength





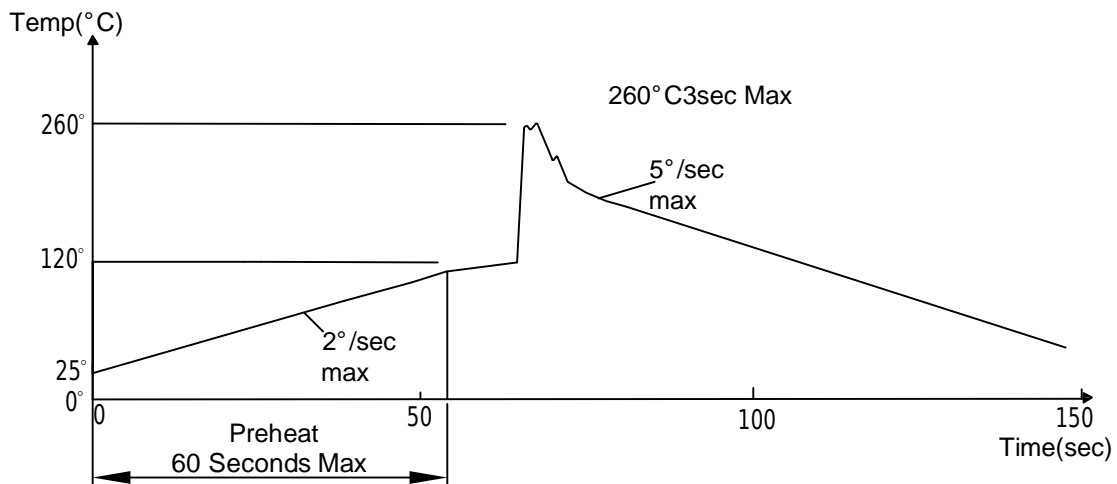
### Soldering Condition(Pb-Free)

#### 1.Iron:

Soldering Iron:30W Max  
Temperature 350° C Max  
Soldering Time:3 Seconds Max(One time only)  
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



Note: 1.Wave solder should not be made more than one time.  
2.You can just only select one of the soldering conditions as above.





Reliability Test:

| Test Item                           | Test Condition   | Description   | Reference Standard   |
|-------------------------------------|--|---|--|
| Operating Life Test                 | 1.Under Room Temperature<br>2.If=10mA<br>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<br>MIL-STD-883: 1005<br>JIS C 7021: B-1                      |
| High Temperature Storage Test       | 1.Ta=105 °C±5°C<br>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<br>JIS C 7021: B-10   |
| Low Temperature Storage Test        | 1.Ta=-40 °C±5°C<br>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<br>2.RH=90%~95 %<br>3.t=240hrs ±2hrs                    | The purpose of this test is the resistance of the device under tropical for hours.  | MIL-STD-202:103B<br>JIS C 7021: B-11   |
| Thermal Shock Test                  | 1.Ta=105 °C±5°C & -40 °C±5°C (10min) (10min)<br>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<br>MIL-STD-750: 1051<br>MIL-STD-883: 1011                    |
| Solder Resistance Test              | 1.T.Sol=260 °C±5°C<br>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<br>MIL-STD-750: 2031<br>JIS C 7021: A-1                      |
| Solderability Test                  | 1.T.Sol=230 °C±5°C<br>2.Dwell time=5 ±1sec                             | This test intended to see soldering well performed or not.  | MIL-STD-202: 208D<br>MIL-STD-750: 2026<br>MIL-STD-883: 2003<br>JIS C 7021: A-2 |