

# PRODUCT SPECIFICATION

*Part Number*  
**PDC563SM-CxMxxx**

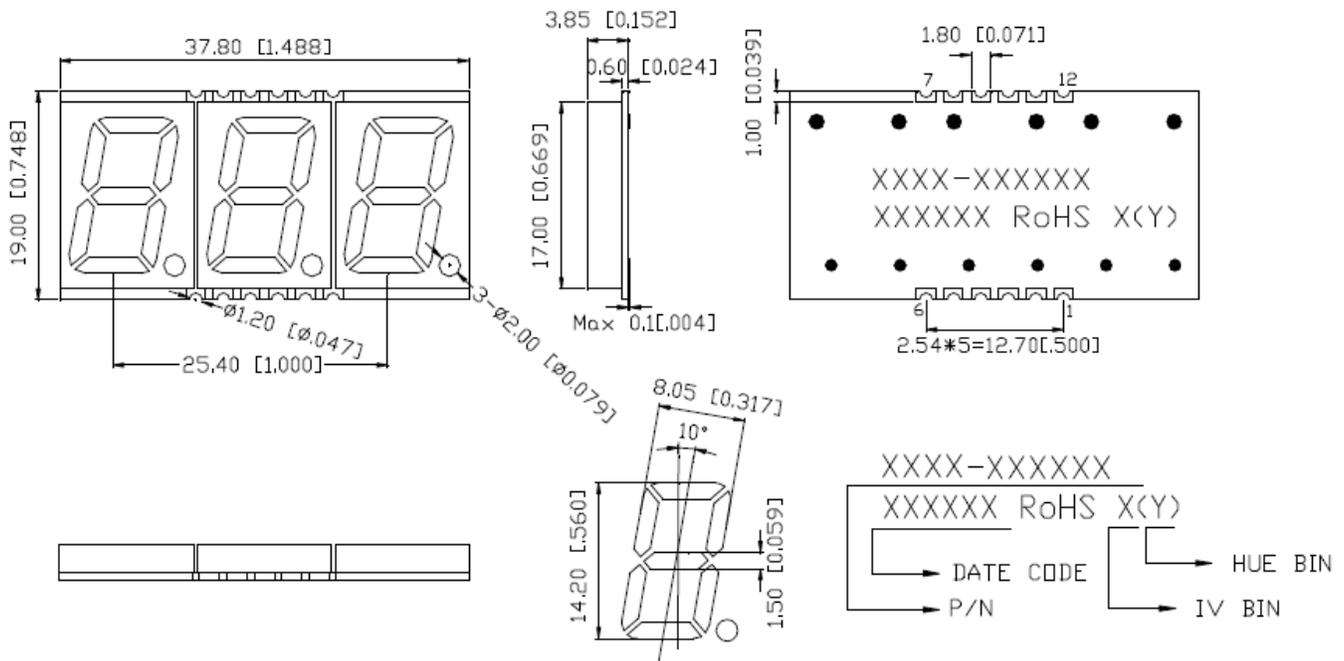
## Details

- .56" (14.2mm) Surface Mount LED Display
- 3 Digit, 7 Segment
- Common Anode or Cathode
- AlInGaP or InGaN dice used

## Features

- Low power consumption
- RoHS Compliant
- Gray Face, White Segments or Black Face, White Segments
- Easy mounting on PCB or socket

## Mechanical Dimensions



## Notes:

1. Dimensions in millimeters [inch], and tolerance is  $\pm 0.25$  [0.010] and angle is  $\pm 1^\circ$  unless otherwise noted.
2. Bending  $\leq$  Length\*1%
3. All pins are 0.50 by 0.30
4. Specifications subject to change without notice



**Device Selection Guide**

| Model Number    | Chip     |                | Description                                 | Note   |
|-----------------|----------|----------------|---|--|
|                 | Material | Emitting Color |   |  |
| PDC563SM-CxMG05 | InGaN    | True Green     | Common Cathode x=C<br>/<br>Common Anode x=A | Add "BFWS" to end of part number for Black Face, White Segment version |
| PDC563SM-CxMG17 | AlInGaP  | Yellow Green   |   |  |
| PDC563SM-CxMY04 |          | Yellow         |   |  |
| PDC563SM-CxMA11 |          | Amber          |   |  |
| PDC563SM-CxMR02 |          | Orange-Red     |   |  |
| PDC563SM-CxMR11 |          | Red            |   |  |
| PDC563SM-CxMR21 |          | Deep Red       |   |  |

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

| Parameter                                     | Symbol           | Rating                  |      | Unit  |
|---|------------------|-------------------------|------|-------|
|   |                  | G17/Y04/A11/R02/R11/R21 | G05  |       |
| Power Dissipation per Dice                    | P <sub>AD</sub>  | 70                      | 114  | mW    |
| Derating Liner from 25°C per Dice             | --               | 0.33                    | 0.4  | mA/°C |
| Continuous Forward Current Per Dice           | I <sub>AF</sub>  | 25                      | 30   | mA    |
| Peak Current Per Dice (duty cycle 1/10, 1KHz) | I <sub>PF</sub>  | 90                      | 100  | mA    |
| Reverse Voltage Per Dice                      | V <sub>R</sub>   | 5                       | 5    | V     |
| Electrostatic Discharge (HBM)                 | ESD              | /                       | 1000 | V     |
| Operating Temperature                         | T <sub>opr</sub> | -40~+105                |      | °C    |
| Storage Temperature                           | T <sub>stg</sub> | -40~+105                |      | °C    |

*Electrical and Optical Characteristics at Ta=25°C*

| Parameter   | Symbol                | Chip                        | Min. | Typ.    | Max. | Unit    | Condition |
|---|-----------------------|-----------------------------|------|---------|------|---------|-----------|
| Forward Voltage Per Segment                       | VF                    | G05                         | --   | 3.2     | 3.8  | V       | IF=20mA   |
|   |                       | G17/Y04/A11/<br>R02/R11/R21 | --   | 2       | 2.8  |         |           |
| Luminous Intensity Per Segment                    | Iv                    | G05                         | --   | 70      | --   | mcd     | IF=10mA   |
|   |                       | G17                         | --   | 3       | --   |         |           |
|   |                       | Y04                         | --   | 17      | --   |         |           |
|   |                       | A11                         | --   | 18      | --   |         |           |
|   |                       | R02                         | --   | 8       | --   |         |           |
|   |                       | R11                         | --   | 9       | --   |         |           |
|   |                       | R21                         | --   | 6       | --   |         |           |
| Peak Emission Wavelength /<br>Dominant Wavelength | $\lambda P/\lambda d$ | G05                         | --   | *525    | --   | nm      | IF=20mA   |
|   |                       | G17                         | --   | 572/570 | --   |         |           |
|   |                       | Y04                         | --   | 592/590 | --   |         |           |
|   |                       | A11                         | --   | 612/605 | --   |         |           |
|   |                       | R02                         | --   | 632/625 | --   |         |           |
|   |                       | R11                         | --   | 644/630 | --   |         |           |
|   |                       | R21                         | --   | 660/645 | --   |         |           |
| Reverse Current                                   | IR                    |                             | --   | --      | 100  | $\mu A$ | VR=5V     |
| Luminous Intensity Matching<br>Ratio              | Iv-m                  |                             | --   | --      | 2:1  | --      | IF=10mA   |

### Typical Electrical/Optical Characteristic Curves

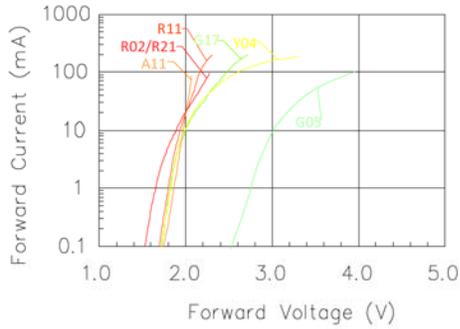


Fig 1. Forward Current vs. Forward Voltage

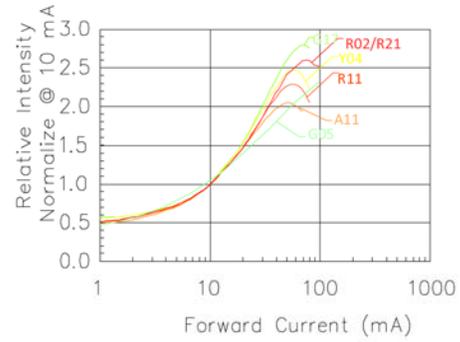


Fig 2. Relative Intensity vs. Forward Current

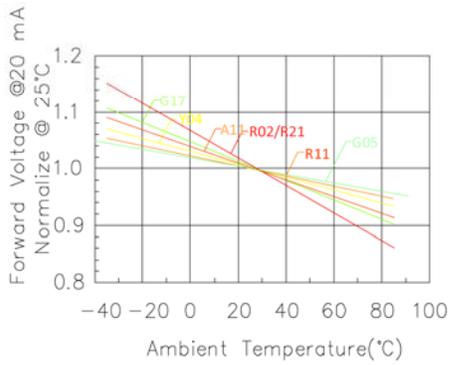


Fig 3. Forward Voltage vs. Temperature

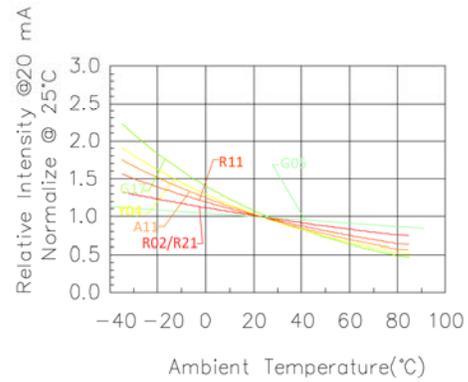


Fig 4. Relative Intensity vs. Temperature

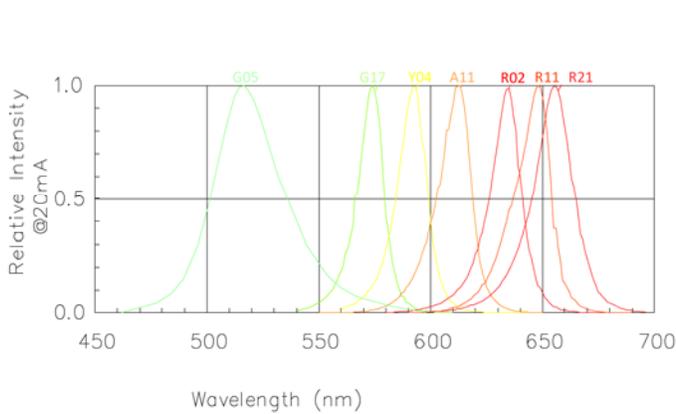


Fig 5. Relative Intensity vs. Wavelength

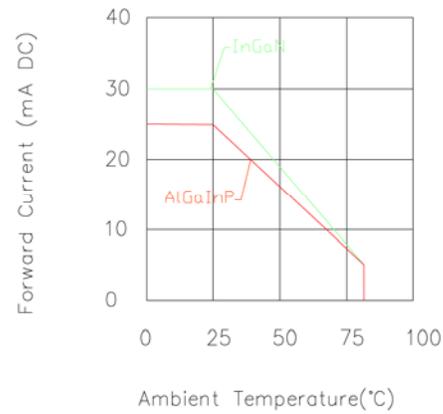


Fig 3. Forward Current vs. Ambient Temperature



**Luminous General lv Bin Grade (IF = 10mA)**

**Color Rank Limits (IF=20mA)**

Remark: Unit=mcd

\*Tolerance: ±20%

Remark: Unit=nm

\*Tolerance: ±1

● Pure Green(G05)

| M      | N      | P       |
|--------|--------|---------|
| 27.559 | 44.096 | 70.555  |
| I      | I      | I       |
| 44.095 | 70.554 | 112.888 |

| 1     | 2     | 3     | 4     | 5     |
|-------|-------|-------|-------|-------|
| 515.0 | 517.0 | 519.0 | 521.0 | 523.0 |
| I     | I     | I     | I     | I     |
| 517.0 | 519.0 | 521.0 | 523.0 | 525.0 |

● Yellow Green(G17)

| F     | G     | H     |
|-------|-------|-------|
| 1.641 | 2.627 | 4.204 |
| I     | I     | I     |
| 2.626 | 4.203 | 6.726 |

| 0     | 1     | 2     | 3     | 4     |
|-------|-------|-------|-------|-------|
| 567.5 | 569.5 | 570.5 | 571.5 | 573.0 |
| I     | I     | I     | I     | I     |
| 569.4 | 570.4 | 571.4 | 572.9 | 575.0 |

● Yellow (Y04)

| J      | K      | L      |
|--------|--------|--------|
| 6.727  | 10.764 | 17.224 |
| I      | I      | I      |
| 10.763 | 17.223 | 27.558 |

| 1     | 2     | 3     | 4     | 5     |
|-------|-------|-------|-------|-------|
| 583.0 | 585.0 | 587.0 | 589.0 | 591.0 |
| I     | I     | I     | I     | I     |
| 585.0 | 587.0 | 589.0 | 591.0 | 593.0 |

● Amber (A11)

| K      | L      | M      |
|--------|--------|--------|
| 10.764 | 17.224 | 27.559 |
| I      | I      | I      |
| 17.223 | 27.558 | 44.095 |

● Orange (R02)

| H     | J      | K      |
|-------|--------|--------|
| 4.204 | 6.727  | 10.764 |
| I     | I      | I      |
| 6.726 | 10.763 | 17.223 |

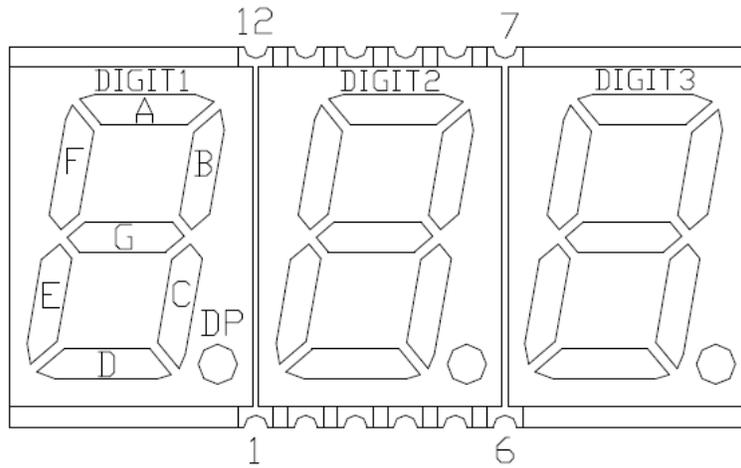
● Red (R11)

| H     | J      | K      |
|-------|--------|--------|
| 4.204 | 6.727  | 10.764 |
| I     | I      | I      |
| 6.726 | 10.763 | 17.223 |

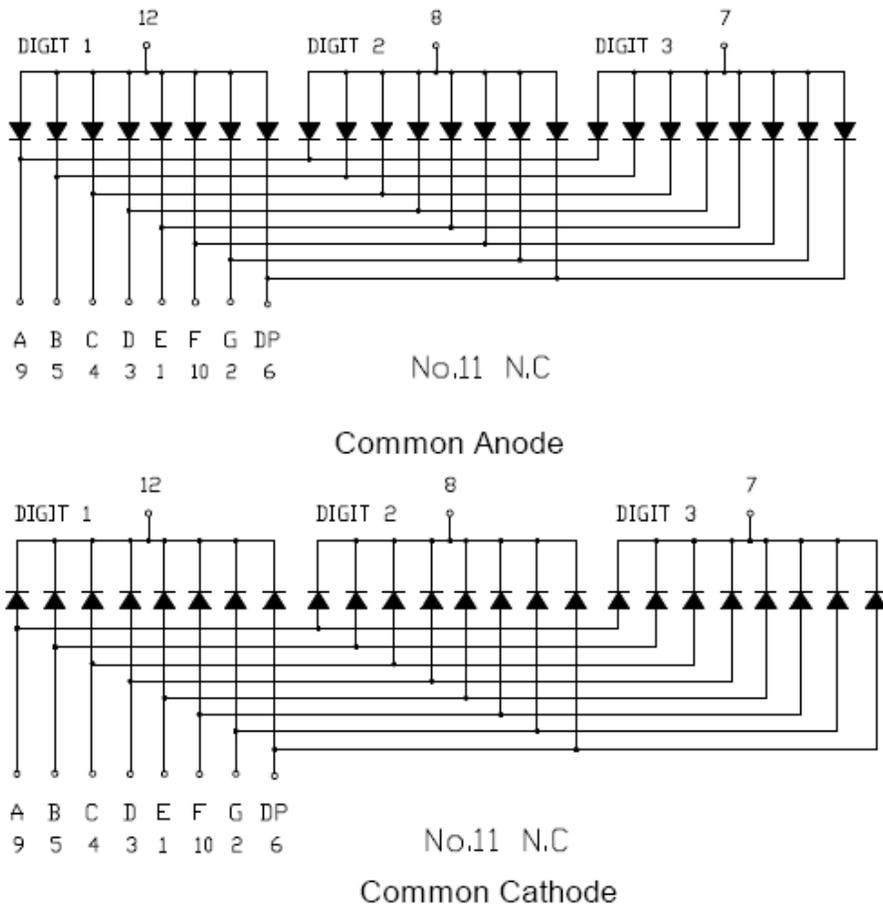
● Deep Red (R21)

| G     | H     | J      |
|-------|-------|--------|
| 2.627 | 4.204 | 6.727  |
| I     | I     | I      |
| 4.203 | 6.726 | 10.763 |

**All Light-On Segments Feature & Pad Position**



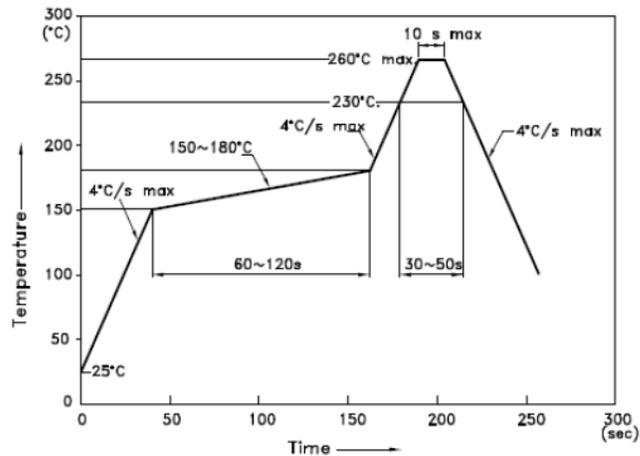
**Internal Circuit Diagram**



### Precautions for Use

#### 1. Recommended soldering conditions

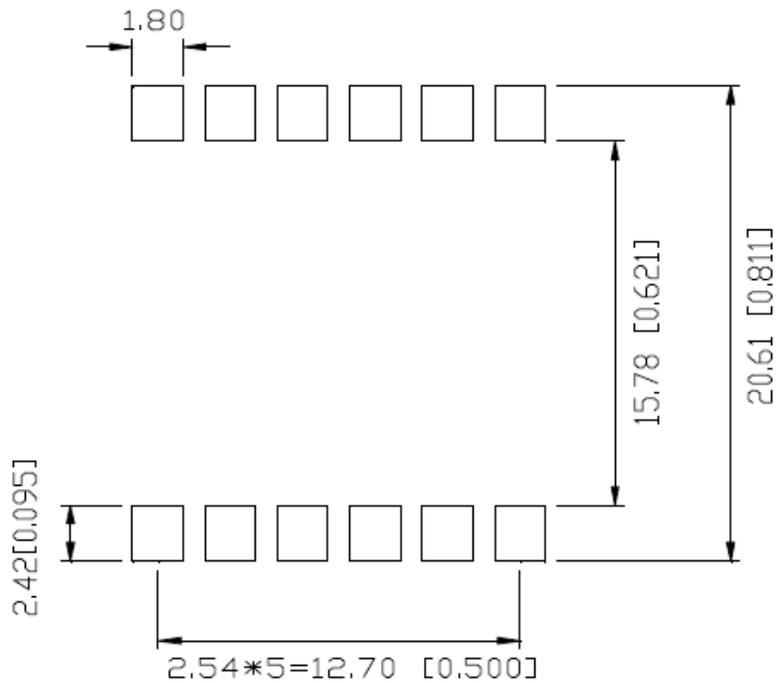
##### 1.1. Wave soldering



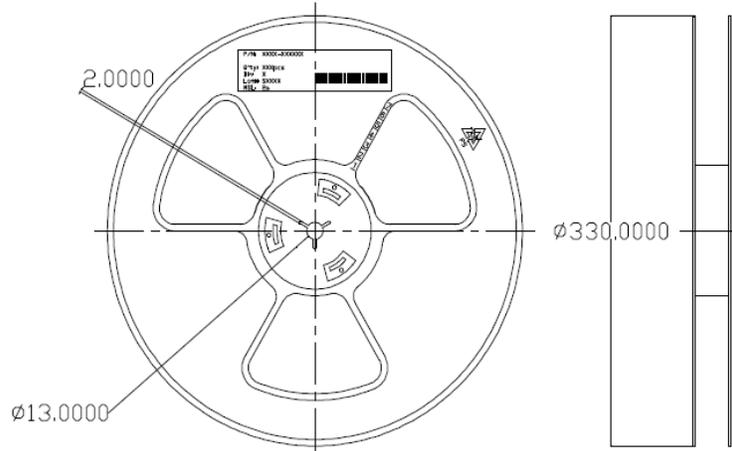
**NOTES:**

1. We recommend the reflow temperature 245°C(±5°C). The maximum soldering temperature should be limited to 260°C.
2. Don't cause stress to the epoxy resin while it is exposed to high temperature.
3. Number of reflow process shall be 2 times or less.

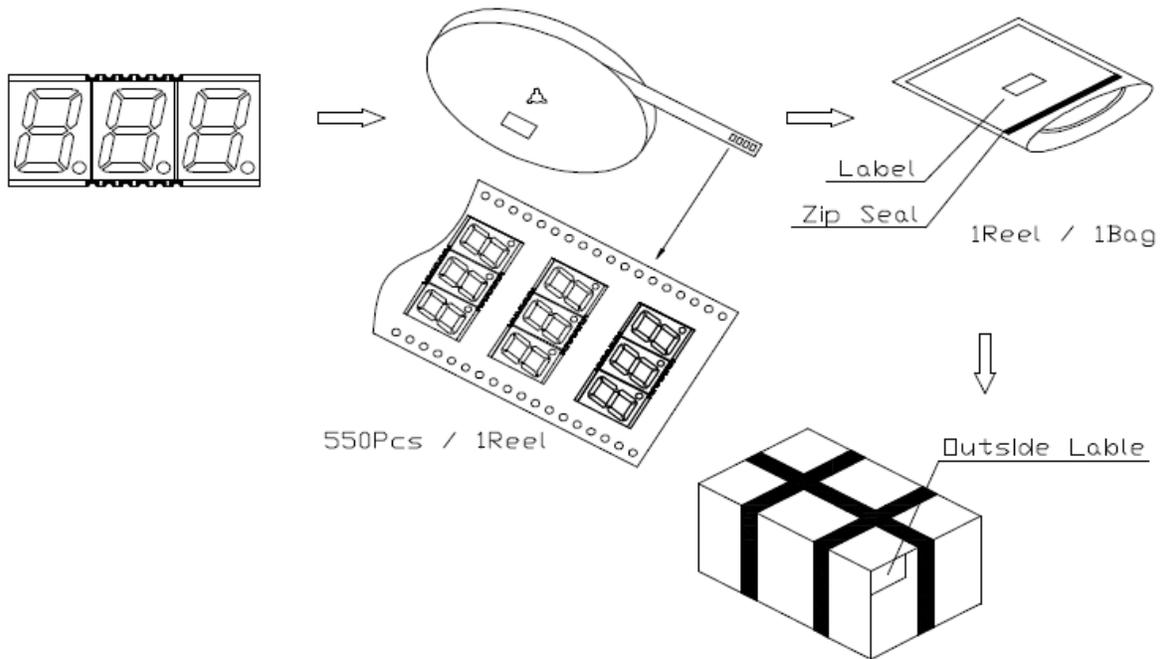
##### 1.2. Recommended Soldering Pad:



**Reel Dimensions**



**Packing Dimensions**



Note: 1. Specifications subject to change without notice.

