

# PRODUCT SPECIFICATION

*Part Number*  
**PDC40SM-CCDG05**

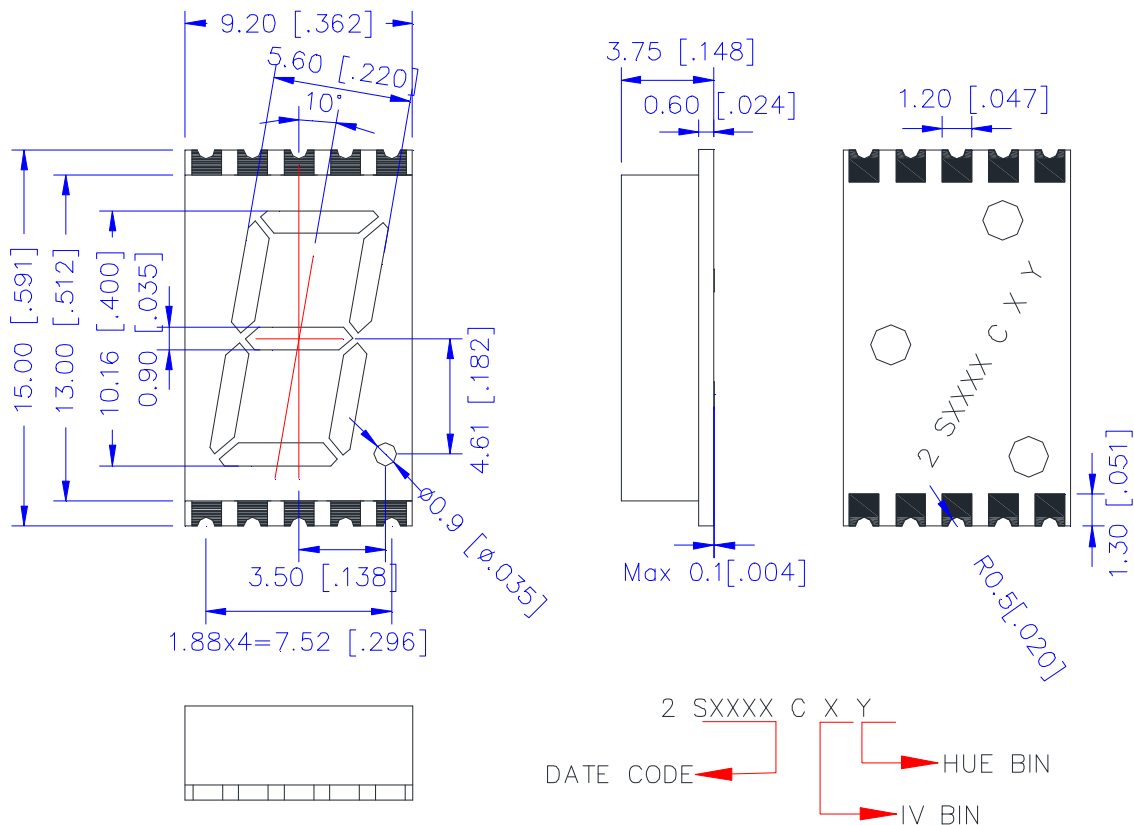
## Details

- 0.40" Surface Mount LED Display
- 1 Digit, 7 Segment
- Common Cathode
- InGaN Chip Material
- Emitting Color: Pure Green

## Features

- Low power consumption
- RoHS Compliant
- Gray Face, White Segments
- Easy mounting on PCB
- JEDEC MSL 2a

## Mechanical Dimensions



## Notes:

1. Dimensions in millimeters [inch], and tolerance is  $\pm 0.25$  [.010] unless otherwise noted.
2. Specifications subject to change without notice





**Device Selection Guide**

| Model Number   | Chip     |                | Configuration  |
|----------------|----------|----------------|----------------|
|                | Material | Emitting Color |                |
| PDC40SM-CCDG05 | InGaN    | Pure Green     | Common Cathode |

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

| Parameter                                     | Symbol                  | Rating   | Unit  |
|---|-------------------------|----------|-------|
| Power Dissipation per Dice                    | PAD                     | 114      | mW    |
| Derating Liner from 25°C per Dice             | $\Delta I_f / \Delta T$ | 0.4      | mA/°C |
| Continuous Forward Current Per Dice           | I <sub>AF</sub>         | 30       | mA    |
| Peak Current Per Dice (duty cycle 1/10, 1KHz) | I <sub>PF</sub>         | 100      | mA    |
| Reverse Voltage Per Dice                      | VR                      | 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    |
| Hand Soldering Temperature                    | T <sub>sol</sub>        | 350      | °C    |

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

| Parameter                         | Symbol           | Min. | Typ. | Max. | Unit | Condition |
|-----------------------------------|------------------|------|------|------|------|-----------|
| Forward Voltage per Segment       | VF               | --   | 3.2  | 3.8  | V    | IF=20mA   |
| Luminous Intensity per Segment    | I <sub>v</sub>   | 44   | 110  | --   | mcd  | IF=10mA   |
| Dominant Wavelength               | $\lambda_d$      | --   | 525  | --   | nm   | IF=20mA   |
| Reverse Current per Segment       | IR               | --   | --   | 100  | μA   | VR=5V     |
| Luminous Intensity Matching Ratio | I <sub>v-m</sub> | --   | --   | 2:1  | --   | IF=10mA   |

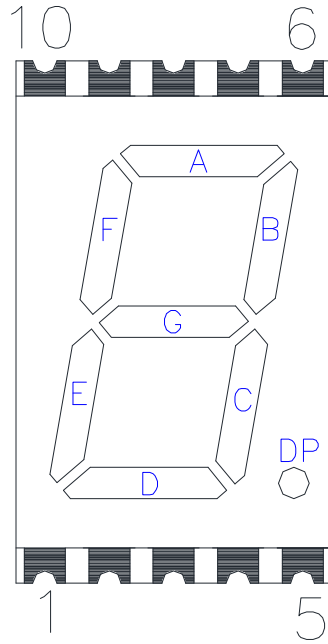
**Luminous General IV Bin Grade (IF=10mA)**

|           |           |           |           |            |            |            |            |          |          |          |           |
|-----------|-----------|-----------|-----------|------------|------------|------------|------------|----------|----------|----------|-----------|
| A         | B         | C         | D         | E          | F          | G          | H          | J        | K        | L        | M         |
| 0.155     | 0.249     | 0.399     | 0.640     | 1.025      | 1.641      | 2.627      | 4.204      | 6.727    | 10.764   | 17.224   | 27.559    |
| 0.248     | 0.398     | 0.639     | 1.024     | 1.640      | 2.626      | 4.203      | 6.726      | 10.763   | 17.223   | 27.558   | 44.095    |
| N         | P         | Q         | R         | S          | T          | U          | V          | W        | X        | Y        | 1         |
| 44.096    | 70.555    | 112.889   | 180.622   | 288.997    | 462.397    | 739.836    | 1183.738   | 1893.982 | 3030.372 | 4848.597 | 7757.756  |
| 70.554    | 112.888   | 180.622   | 288.996   | 462.396    | 739.835    | 1183.737   | 1893.981   | 3030.371 | 4848.596 | 7757.755 | 12412.409 |
| 2         | 3         | 4         | 5         | 6          | 7          | 8          | 9          |          |          |          |           |
| 4034.034  | 19859.858 | 31775.773 | 50841.238 | 81345.982  | 130153.573 | 208245.718 | 333193.149 |          |          |          |           |
| 19859.857 | 31775.772 | 50841.237 | 81345.981 | 130153.572 | 208245.717 | 333193.148 | 533109.039 |          |          |          |           |

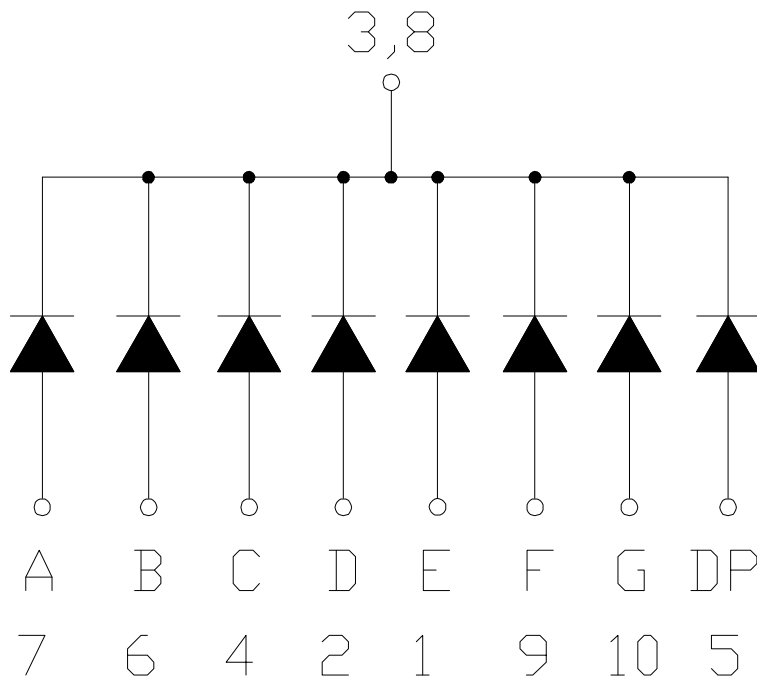
**Color Rank Limits (IF=10mA)**

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

*All Light On Segments Feature & Pad Position*



*Internal Circuit Diagram*



### Typical Electrical / Optical Characteristic Curves

- (Ta = 25°C Unless Otherwise Noted)

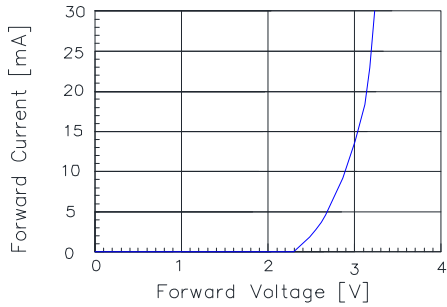


Fig 1. Forward Current vs. Forward Voltage

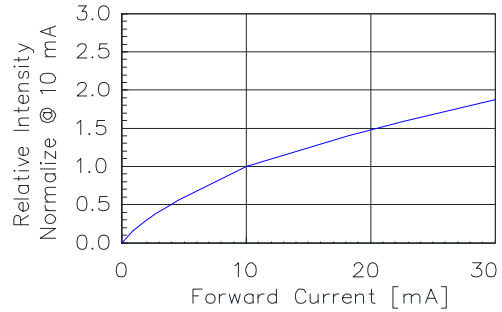


Fig 2. Relative Intensity vs. Forward Current

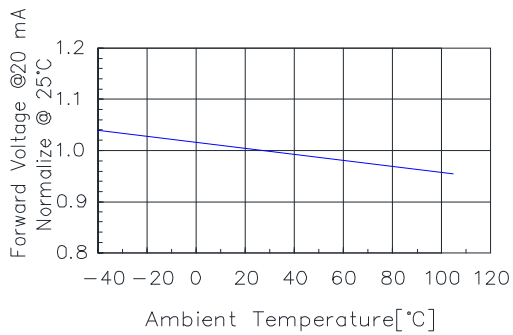


Fig 3. Forward Voltage vs. Temperature

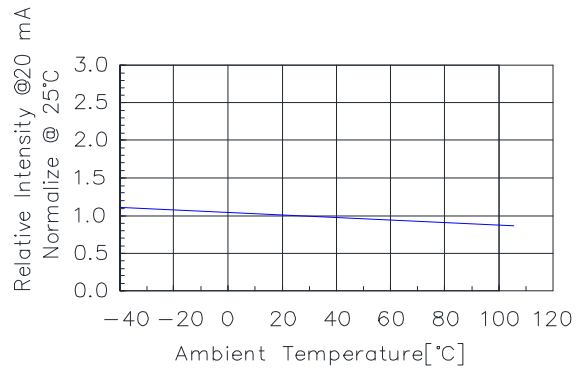


Fig 4. Relative Intensity vs. Temperature

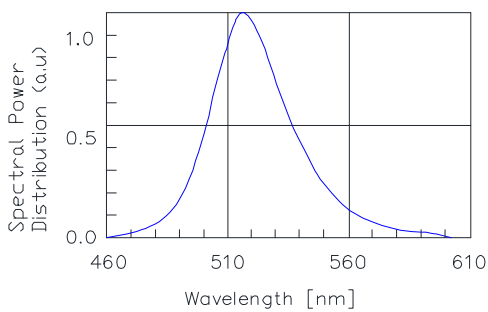


Fig 5. Spectral Power Distribution vs. Wavelength

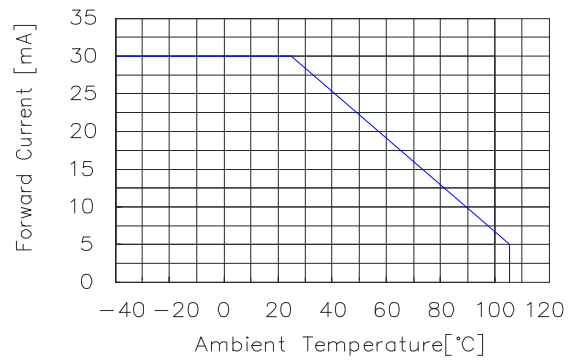
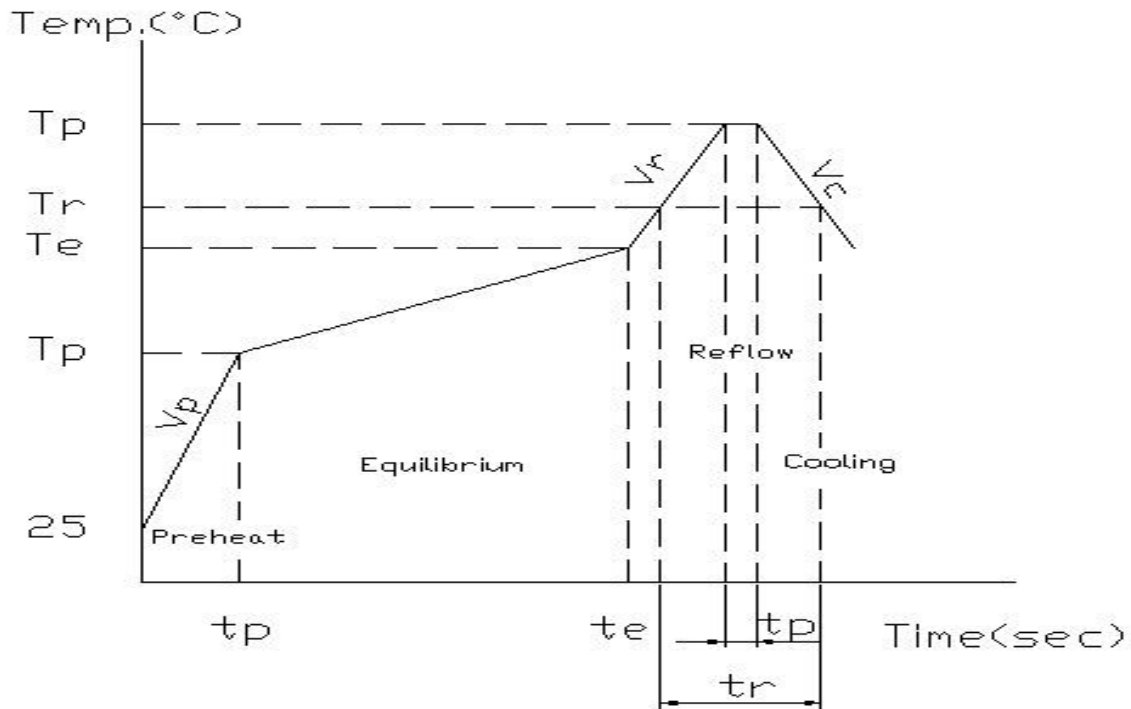


Fig 6. Forward current vs. Temperature

## Soldering Characteristics

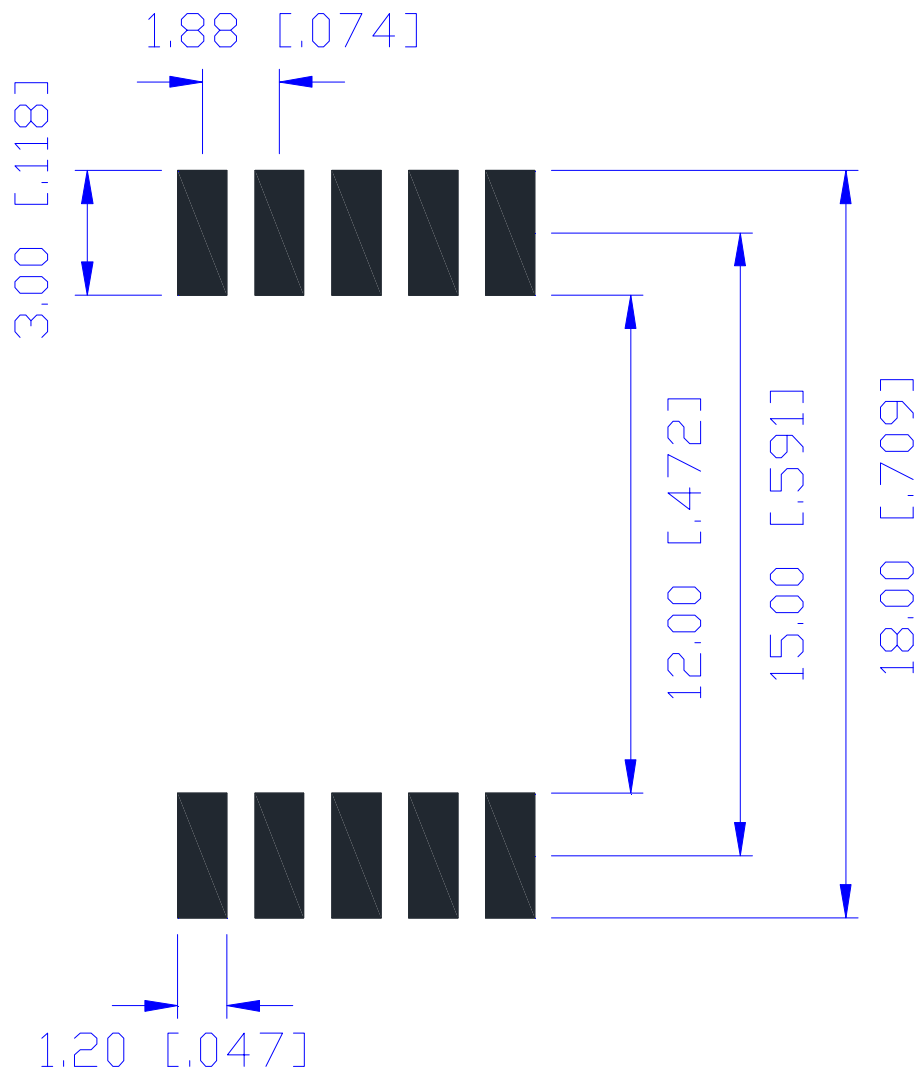
### 1. IR-Reflow Soldering Profile

| Area           | Title            | Symbol | Min | Max | Unit   |
|----------------|------------------|--------|-----|-----|--------|
| (1)Preheat     | Ramp-up rate     | Vp     | 1   | 5   | °C/sec |
|                | temperature      | Tp     | 150 | —   | °C     |
|                | time             | tp     | —   | —   | sec    |
| (2)Equilibrium | Ramp-up rate     | Ve     | —   | —   | °C/sec |
|                | temperature      | Te     | 150 | 200 | °C     |
|                | Time             | te     | 60  | 120 | sec    |
| (3)Reflow      | Ramp-up rate     | Vr     | 1   | 5   | °C/sec |
|                | temperature      | Tr     | 220 | —   | °C     |
|                | Time             | tr     | —   | 60  | sec    |
|                | Peak temperature | Trp    | —   | 260 | °C     |
|                | Peak time        | trp    | —   | 10  | sec    |
| (4)Cooling     | Ramp-down rate   | Vc     | 3   | 6   | °C/sec |

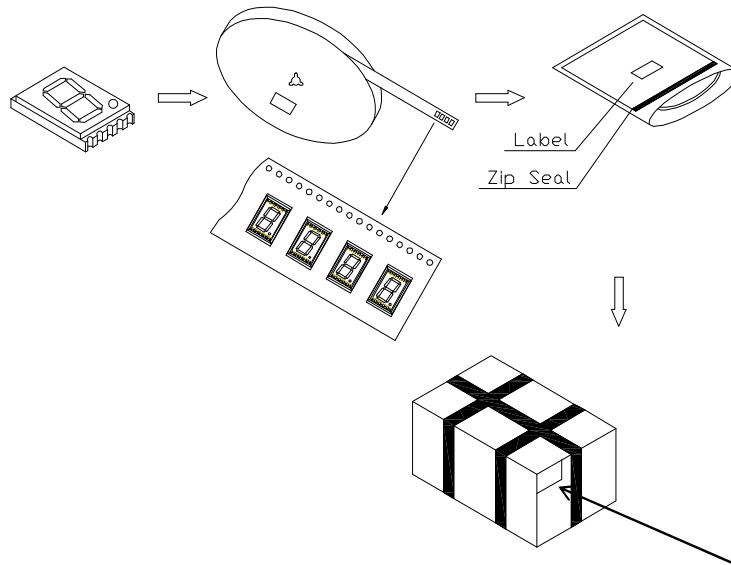
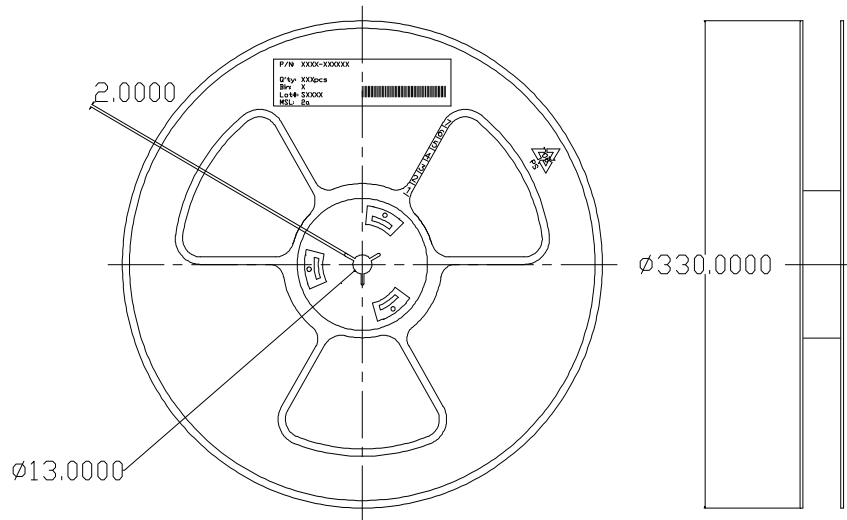


2. Hand Soldering (Iron Condition)
  - a. Soldering Iron: 30W Max
  - b. Temperature 350C Max
  - c. Soldering Time: 3 Seconds Max (One Time)
  - d. Distance: 1.6mm Min (From Seating Plane)

***Soldering Pad Size***



### Reel & Packing Dimensions



|           |                |
|-----------|----------------|
| TRAY DATE | _____          |
| CODE      | _____          |
| P/N:      | PDC40SM-CCDG05 |
| MSST:     | 430X330X270mm  |
| N.W:      | _____ KGS      |
| G.W:      | _____ KGS      |
| Q'TY      | _____ PCS      |

| Package Name | Size               | Unit | Amount | Unit | Amount | Unit | Notes |
|--------------|--------------------|------|--------|------|--------|------|-------|
| Reel         | Φ330               | mm   | 1      | Reel | 1000   | pcs  | /     |
| Bag          | L450 x W430        | mm   | 1      | Reel | 1000   | pcs  | /     |
| Outer Box    | L430 x W330 x H270 | mm   | 5      | Bag  | 5000   | pcs  | /     |

