



**Opto Plus LED Corp.**  
**0.40" SMD Type LED Display**  
**OPS-Q4012SE | OPS-Q4013SE**

● **EDIT HISTORY**

Version A: Nov. 24, 2020

Preliminary Spec.



[www.opledtw.com](http://www.opledtw.com)

# Opto Plus LED Corp.

## 0.40" SMD Type LED Display

### OPS-Q4012SE | OPS-Q4013SE

#### ● FEATURES

- 0.40 inch (10.16 mm) digit height.
- SMD type.
- Low current operation.
- RoHS Compliant, Pb Free.

#### ● DESCRIPTION

The device are 0.40 inch (10.16 mm) height quadruple digit 7-segment displays.

The device is Opto Plus LED Corp standard LED Display.

This device utilizes Super Bright Red LED chip which are made from AlGaInP

On a transparent GaAs, substrate.

The device has face and segment option, please refer to **PRODUCT APPEARANCE**.

#### ● DEVICE

| PART NO.       | DESCRIPTION                                 |
|----------------|---|
| OPS-Q4012SE-GW | Common Anode   Gray face   White segment    |
| OPS-Q4013SE-GW | Common Cathode   Gray face   White segment  |
| OPS-Q4012SE-BW | Common Anode   Black face   White segment   |
| OPS-Q4013SE-BW | Common Cathode   Black face   White segment |

#### RoHS Compliance



#### Pb Free.



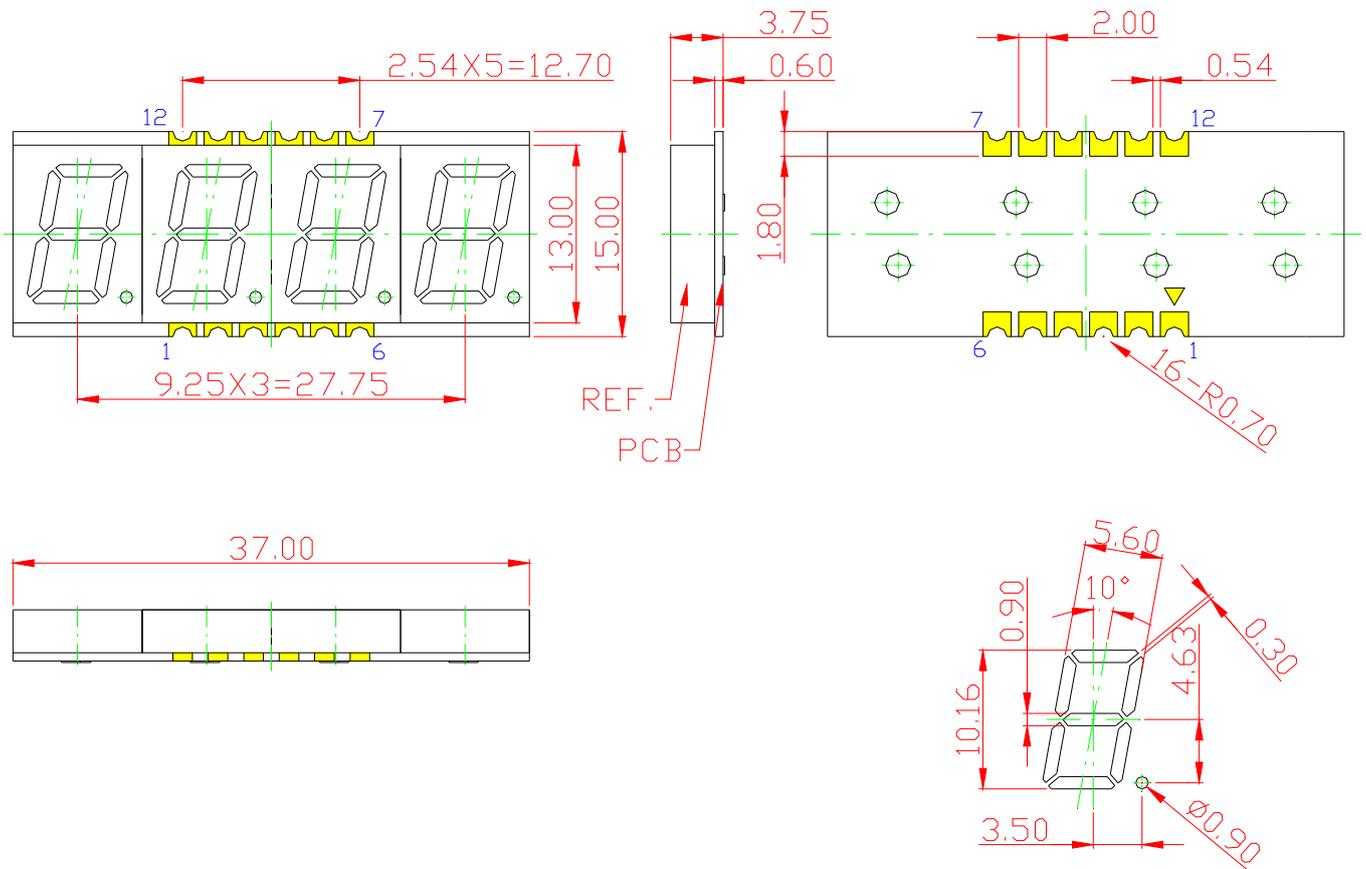


# Opto Plus LED Corp.

## 0.40" SMD Type LED Display

### OPS-Q4012SE | OPS-Q4013SE

#### ● MECHANICAL DIMENSIONS



NOTES: All dimensions are in millimeters. Tolerances are  $\pm 0.25$  mm unless otherwise noted.



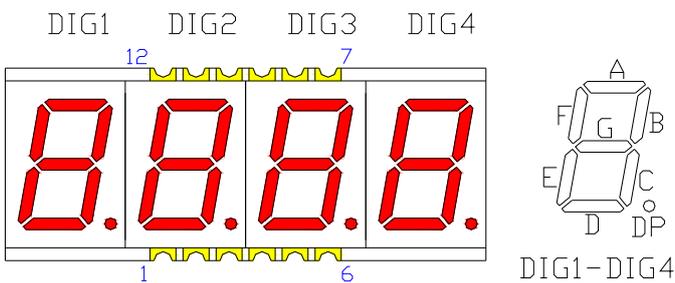
# Opto Plus LED Corp.

## 0.40" SMD Type LED Display

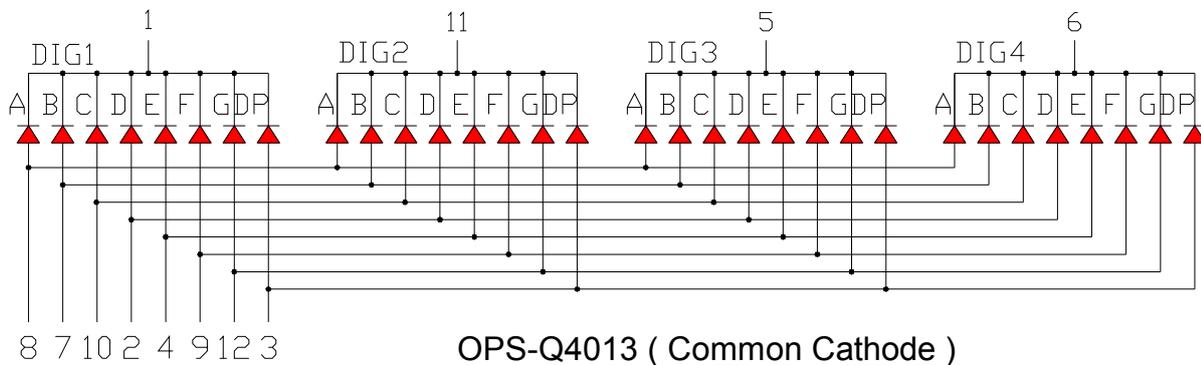
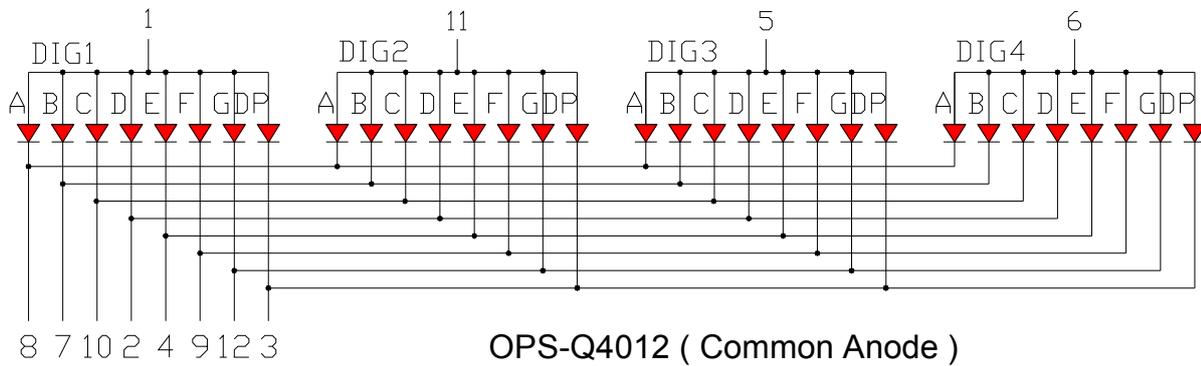
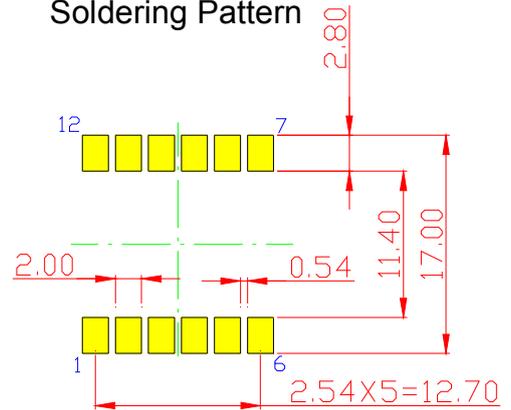
### OPS-Q4012SE | OPS-Q4013SE

#### ● TYPICAL INTERNAL EQUIVALENT CIRCUIT

Turn On Color



Recommended Soldering Pattern



※EMITTED COLOR : SUPER BRIGHT RED

Opto Plus LED Corp. 7F-3, No.496, Bannan Road, Zhonghe Dist., New Taipei City 235, Taiwan (R.O.C)  
 Website: [www.opledtw.com](http://www.opledtw.com) E-mail: [sales@opledtw.com](mailto:sales@opledtw.com) Tel: 886-2-2222-5698 Fax: 886-2-2222-2566

Disclaimer:  
 Subject to change without notice



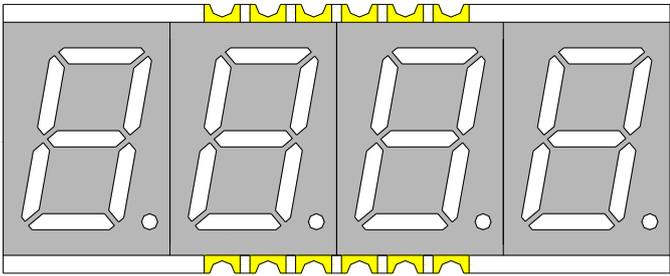
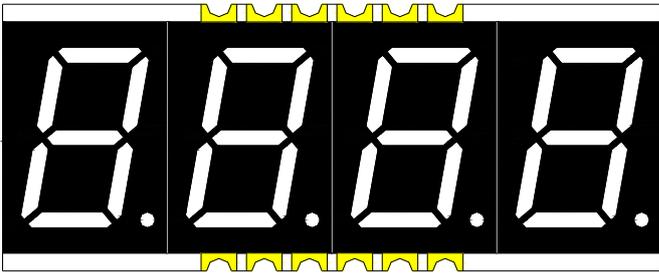
# Opto Plus LED Corp.

## 0.40'' SMD Type LED Display

### OPS-Q4012SE | OPS-Q4013SE

#### ● PRODUCT APPEARANCE

The most common reflector color and segment color are show in below diagram.

| -GW   | -BW  |
|---|--|
|                         |                         |
| <ul style="list-style-type: none"> <li>※ REFLECTOR COLOR: Gray</li> <li>※ SEGMENT COLOR: White</li> </ul> | <ul style="list-style-type: none"> <li>※ REFLECTOR COLOR: Black</li> <li>※ SEGMENT COLOR: White</li> </ul> |

Opto Plus can customize reflector and segment colors by customer's request. If you have these request please visit [www.opledtw.com](http://www.opledtw.com) or contact [sales@opledtw.com](mailto:sales@opledtw.com) for more **Standard Product Customization** information.

Part NO. related to reflector and segment colors show as table below.

| PART NO.       | DESCRIPTION                                 |
|----------------|---|
| OPS-Q4012SE-GW | Common Anode   Gray face   White segment    |
| OPS-Q4013SE-GW | Common Cathode   Gray face   White segment  |
| OPS-Q4012SE-BW | Common Anode   Black face   White segment   |
| OPS-Q4013SE-BW | Common Cathode   Black face   White segment |



[www.opledtw.com](http://www.opledtw.com)

## Opto Plus LED Corp. 0.40'' SMD Type LED Display OPS-Q4012SE | OPS-Q4013SE

### ● SE: SUPER BRIGHT RED (AlGaInP/GaAs)

ABSOLUTE MAXIMUM RATING AT Ta=25°C

| Parameter                            | Symbol    | Maximum Rating | Unit |
|--------------------------------------|-----------|----------------|------|
| Power dissipation                    | $P_{AD}$  | 48             | mW   |
| Continuous forward current           | $I_{AF}$  | 20             | mA   |
| Peak current (duty cycle 1/10, 1kHz) | $I_{PF}$  | 40             | mA   |
| Reverse voltage                      | $V_R$     | 5              | V    |
| Operating temperature                | $T_{OPR}$ | -40 to +105    | °C   |
| Storage temperature                  | $T_{STG}$ | -40 to +105    | °C   |

ELECTRICAL - OPTICAL CHARACTERISTICS AT Ta=25°C

| Characteristic               | Symbol          | Condition           | Min. | Type. | Max. | Unit          |
|------------------------------|-----------------|---------------------|------|-------|------|---------------|
| Forward Voltage, (Per Dice)  | $V_F$           | $I_F = 20\text{mA}$ | -    | 2.1   | 2.4  | V             |
| Reverse Current, (Per Dice)  | $I_R$           | $V_R = 5\text{V}$   | -    | -     | 10   | $\mu\text{A}$ |
| Peak Wavelength              | $\lambda_P$     | $I_F = 20\text{mA}$ | -    | 632   | -    | nm            |
| Dominant Wavelength          | $\lambda_D$     | $I_F = 20\text{mA}$ | 619  | -     | 629  | nm            |
| Luminous Intensity           | $I_v$           | $I_F = 20\text{mA}$ | 15   | 32.5  | 60   | mcd           |
| Spectral Line Half-Bandwidth | $\Delta\lambda$ | $I_F = 20\text{mA}$ | -    | 20    | -    | nm            |



**Opto Plus LED Corp.**  
**0.40" SMD Type LED Display**  
**OPS-Q4012SE | OPS-Q4013SE**

● **SE: BIN GRADE (Unit :mcd) 20mA**

| Super Bright Red | M           | N           | O           |
|------------------|-------------|-------------|-------------|
|                  | 15.0 – 25.0 | 25.1 – 40.0 | 40.1 - 60.0 |

● **SE: HUE GRADE ( $\lambda_D$  : nm)**

| 1             | 2             | 3             |
|---------------|---------------|---------------|
| 619.0 – 622.0 | 622.1 – 626.0 | 626.1 – 629.0 |

● **AVAILABLE BIN / HUE TABLE**

|    |    |    |
|----|----|----|
| M1 | M2 | M3 |
| N1 | N2 | N3 |
| O1 | O2 | O3 |



# Opto Plus LED Corp.

## 0.40" SMD Type LED Display

### OPS-Q4012SE | OPS-Q4013SE

#### ● SE: SUPER BRIGHT RED (AlGaInP/GaAs) CURVE

Typical Electro-optical Characteristic Curves  
(25 °C Free Air Temperature Unless Otherwise Specified)

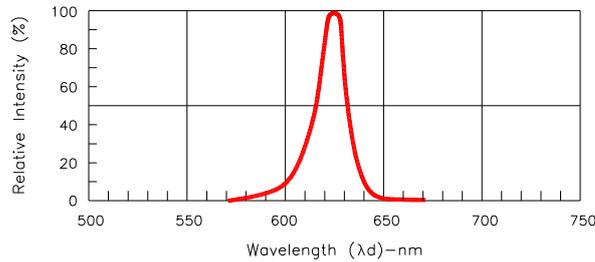


Fig.1-Relative Intensity VS. Wavelength

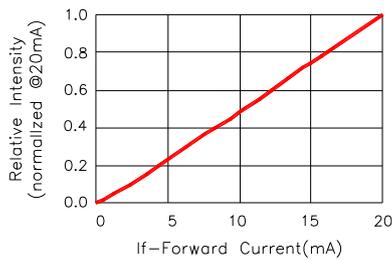


Fig.2-Relative Luminous Intensity vs. Forward Current

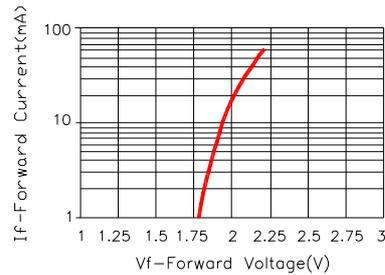


Fig.3-Forward Current vs. Forward Voltage

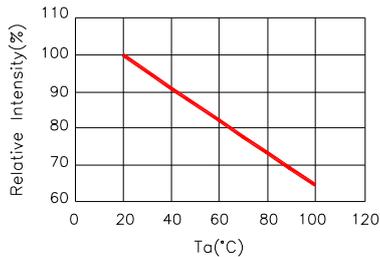


Fig.4-Relative Intensity(@20mA) vs. Ambient Temperature

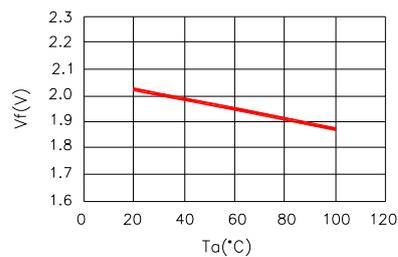


Fig.5-Forward Voltage(@20mA) vs. Ambient Temperature

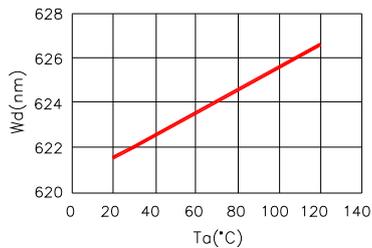


Fig.6-Dominant Wavelength(@20mA)  
VS. Ambient Temperature

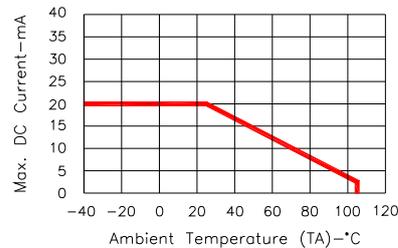


Fig.7-Max. Allowable DC Current  
VS. Ambient Temperature



[www.opledtw.com](http://www.opledtw.com)

# Opto Plus LED Corp.

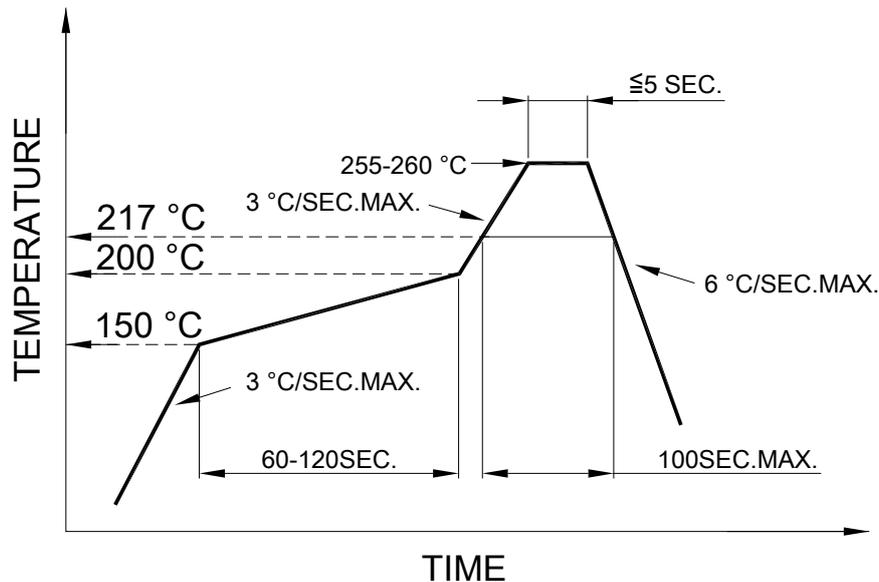
## 0.40" SMD Type LED Display

### OPS-Q4012SE | OPS-Q4013SE

#### ● SMT REFLOW SOLDERING INSTRUCTIONS

SMT Soldering Profile

Pb free reflow soldering Profile



- We recommend the reflow temperature 245°C (+/- 5°C).  
The maximum soldering temperature should be limited to 260°C.
- Number of reflow process shall be 2 times or less.

#### ● SOLDERING IRON

Basic spec is  $\leq 4$  sec when 260°C. If temperature is higher, time should be shorter (+10°C → 1 sec). Power dissipation of Iron should be smaller than 15W, and temperature should be controllable. Surface temperature of the device should be under 230°C.

#### ● REWORK

- Customer must finish rework within 3 sec. under 350°C.
- The head of soldering iron cannot touch copper foil.



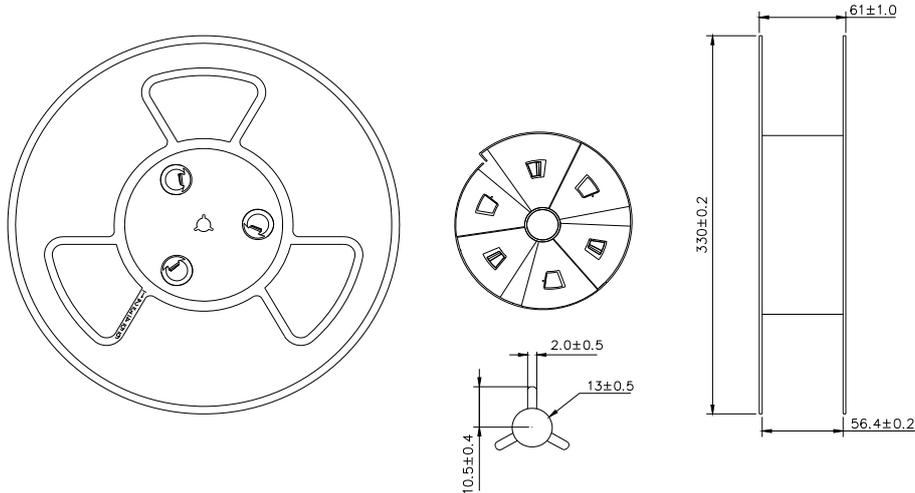
[www.opledtw.com](http://www.opledtw.com)

# Opto Plus LED Corp.

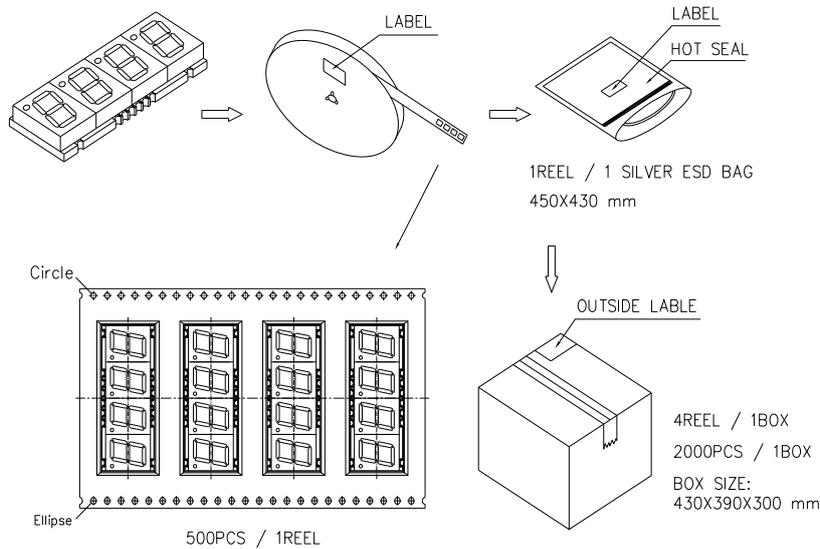
## 0.40" SMD Type LED Display

### OPS-Q4012SE | OPS-Q4013SE

#### ● REEL DIMENSIONS



#### ● PACKING & LABEL SPECIFICATIONS



#### ● STORAGE CONDITION

In factory original sealed bag package

| TEMPERATURE CONDITION | HUMIDITY CONDITION |
|-----------------------|--------------------|
| 5°C ~ 30°C            | Below 60%RH        |

After opened and not in factory original sealed bag package

| TEMPERATURE CONDITION | HUMIDITY CONDITION | STORAGE TIME                     |
|-----------------------|--------------------|----------------------------------|
| 5°C ~ 30°C            | Below 60%RH        | Within 4 weeks (MSL as level 2a) |