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**Opto Plus LED Corp.**  
**0.20" SMD Type LED Display**  
**OPS-Q2040LR-STT(R)-1.5-G(B)W**  
**OPS-Q2041LR-STT(R)-1.5-G(B)W**

● **EDIT HISTORY**

Version A: Mar. 24, 2025

Preliminary Spec.

Confidential Document



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● **FEATURES**

- 0.20 inch (5.08 mm) Digit Height.
- Low current operation.
- Excellent character appearance.
- Super thin SMD type.
- RoHS compliant, Pb Free.

● **DESCRIPTION**

The device are 0.20 inch (5.08 mm) height quadruple digits 7-segment display.

The device is Opto Plus LED Corp standard LED Display.

This device utilizes Super 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-Q2040LR-STT-1.5-GW	Common Anode   Gray face   White segment   Top mount
OPS-Q2041LR-STT-1.5-GW	Common Cathode   Gray face   White segment   Top mount
OPS-Q2040LR-STT-1.5-BW	Common Anode   Black face   White segment   Top mount
OPS-Q2041LR-STT-1.5-BW	Common Cathode   Black face   White segment   Top mount
OPS-Q2040LR-STR-1.5-GW	Common Anode   Gray face   White segment   Reverse mount
OPS-Q2041LR-STR-1.5-GW	Common Cathode   Gray face   White segment   Reverse mount
OPS-Q2040LR-STR-1.5-BW	Common Anode   Black face   White segment   Reverse mount
OPS-Q2041LR-STR-1.5-BW	Common Cathode   Black face   White segment   Reverse mount

**RoHS Compliance**



**Pb Free.**





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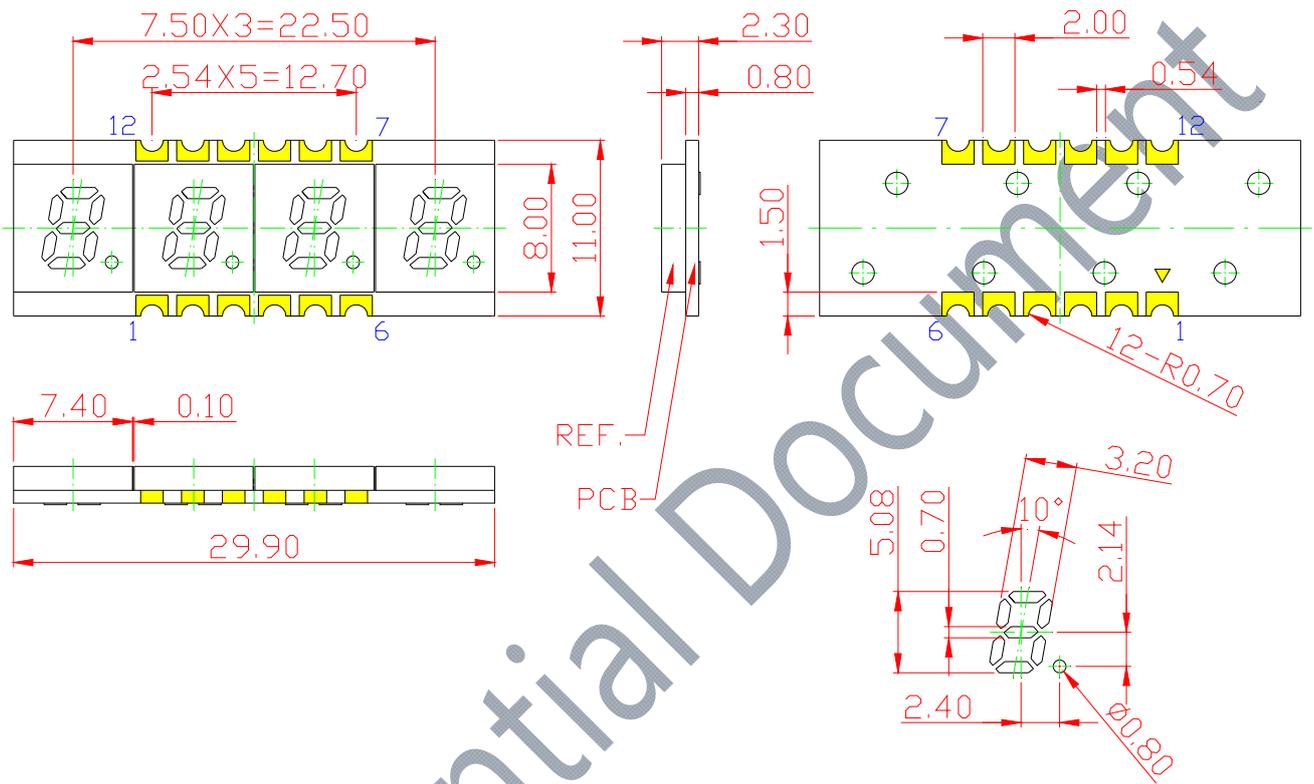
# Opto Plus LED Corp.

## 0.20" SMD Type LED Display

### OPS-Q2040LR-STT(R)-1.5-G(B)W

### OPS-Q2041LR-STT(R)-1.5-G(B)W

#### MECHANICAL DIMENSIONS



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



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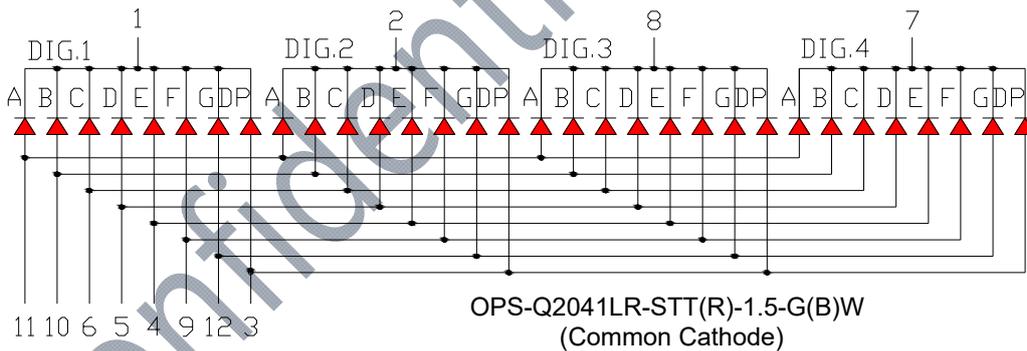
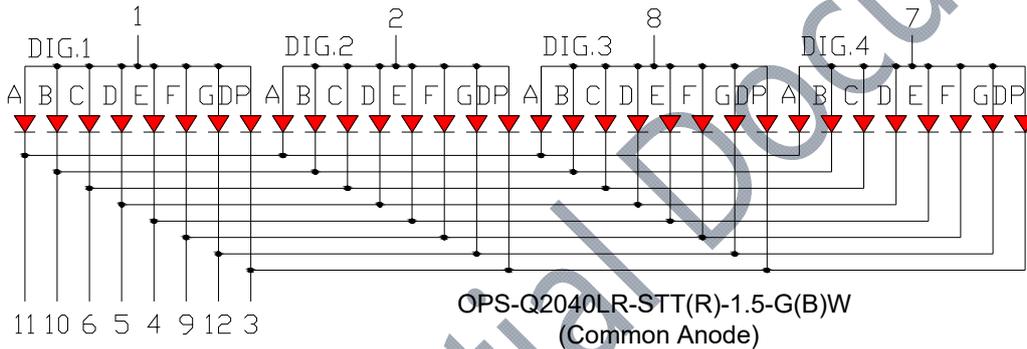
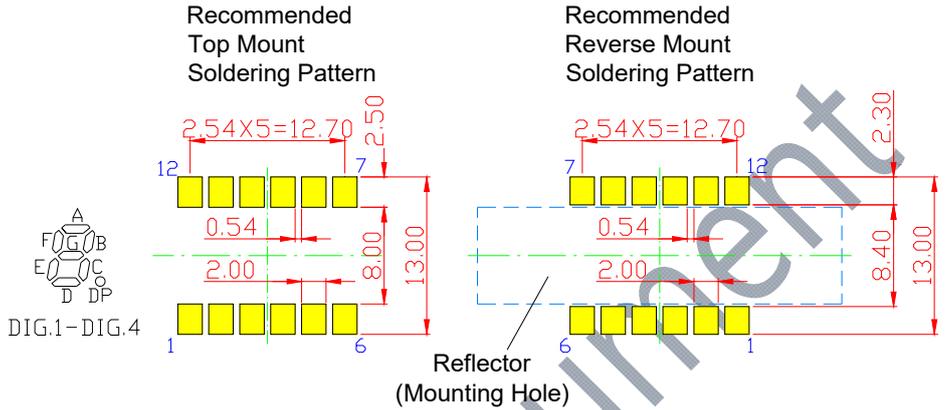
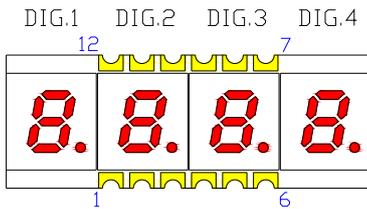
## 0.20" SMD Type LED Display

### OPS-Q2040LR-STT(R)-1.5-G(B)W

### OPS-Q2041LR-STT(R)-1.5-G(B)W

#### ● TYPICAL INTERNAL EQUIVALENT CIRCUIT

Turn On Color



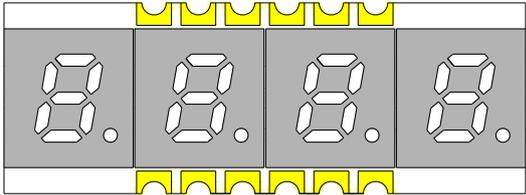
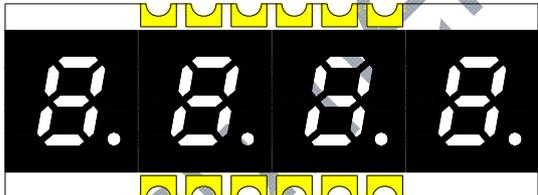
※EMITTED COLOR : SUPER RED



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● **PRODUCT APPEARANCE**

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

-GW	-BW
	
※ REFLECTOR COLOR: Gray ※ SEGMENT COLOR: White	※ REFLECTOR COLOR: Black ※ SEGMENT COLOR: White

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-Q2040LR-STT-1.5-GW	Common Anode   Gray face   White segment   Top mount
OPS-Q2041LR-STT-1.5-GW	Common Cathode   Gray face   White segment   Top mount
OPS-Q2040LR-STT-1.5-BW	Common Anode   Black face   White segment   Top mount
OPS-Q2041LR-STT-1.5-BW	Common Cathode   Black face   White segment   Top mount
OPS-Q2040LR-STR-1.5-GW	Common Anode   Gray face   White segment   Reverse mount
OPS-Q2041LR-STR-1.5-GW	Common Cathode   Gray face   White segment   Reverse mount
OPS-Q2040LR-STR-1.5-BW	Common Anode   Black face   White segment   Reverse mount
OPS-Q2041LR-STR-1.5-BW	Common Cathode   Black face   White segment   Reverse mount



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● **LR: SUPER RED (AlGaInP/GaAs)**

ABSOLUTE MAXIMUM RATING AT Ta=25°C

Parameter	Symbol	Maximum Rating	Unit
Power dissipation	P <sub>AD</sub>	48	mW
Continuous forward current	I <sub>AF</sub>	20	mA
Peak current (duty cycle 1/10, 1kHz)	I <sub>PF</sub>	40	mA
Reverse voltage	V <sub>R</sub>	5	V
Operating temperature	T <sub>OPR</sub>	-40 to +105	°C
Storage temperature	T <sub>STG</sub>	-40 to +105	°C

ELECTRICAL - OPTICAL CHARACTERISTICS AT Ta=25°C

Characteristic	Symbol	Condition	Min.	Type.	Max.	Unit
Forward Voltage, (Per Dice)	V <sub>F</sub>	I <sub>F</sub> = 20mA	-	2.1	2.4	V
Reverse Current, (Per Dice)	I <sub>R</sub>	V <sub>R</sub> = 5V	-	-	10	μA
Peak Wavelength	λ <sub>P</sub>	I <sub>F</sub> = 20mA	-	650	-	nm
Dominant Wavelength	λ <sub>D</sub>	I <sub>F</sub> = 20mA	635	-	648	nm
Luminous Intensity	I <sub>v</sub>	I <sub>F</sub> = 20mA	2	-	12	mcd
Spectral Line Half-Bandwidth	Δλ	I <sub>F</sub> = 20mA	-	20	-	nm



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● **LR: BIN GRADE (Unit : mm) 20mA**

Super Red	<b>F</b>	<b>G</b>	<b>H</b>
	2.0 - 5.0	5.1 - 9.0	9.1 - 12.0

● **LR: HUE GRADE ( $\lambda D$  : nm)**

<b>1</b>	<b>2</b>	<b>3</b>
635.0 – 640.0	640.1 – 644.0	644.1 – 648.0

● **AVAILABLE BIN / HUE TABLE**

F1	F2	F3
G1	G2	G3
H1	H2	H3



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## 0.20" SMD Type LED Display

### OPS-Q2040LR-STT(R)-1.5-G(B)W

### OPS-Q2041LR-STT(R)-1.5-G(B)W

#### ● LR: SUPER RED (AlGaInP/GaAs) CURVE

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

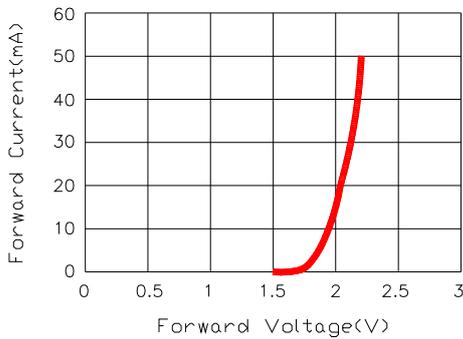


Fig.1 FORWARD CURRENT VS. FORWARD VOLTAGE

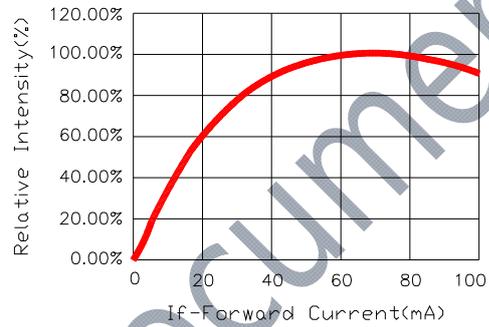


Fig.2 RELATIVE INTENSITY VS. FORWARD CURRENT

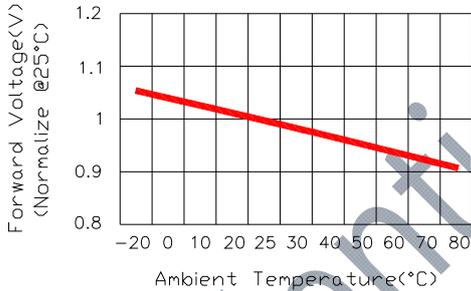


Fig.3 FORWARD VOLTAGE VS. TEMPERATURE

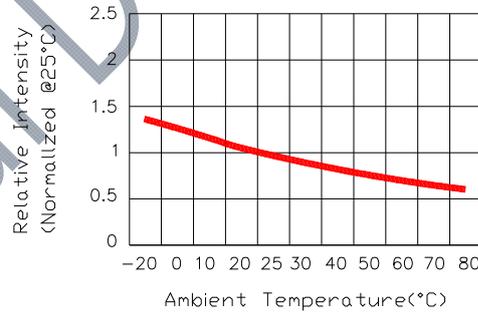


Fig.4 RELATIVE INTENSITY VS. TEMPERATURE

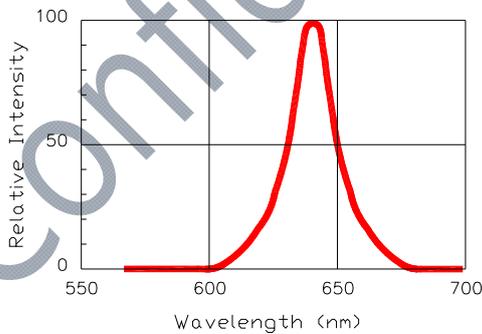


Fig.5 RELATIVE INTENSITY VS. WAVELENGTH

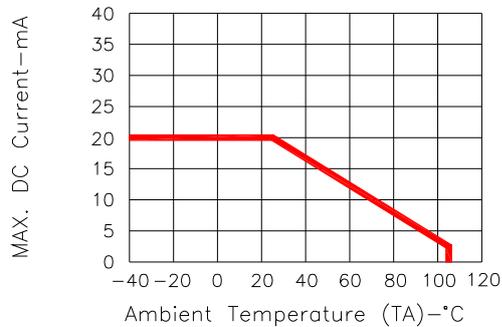


Fig.6 MAX. ALLOWABLE DC CURRENT VS. AMBIENT TEMPERATURE

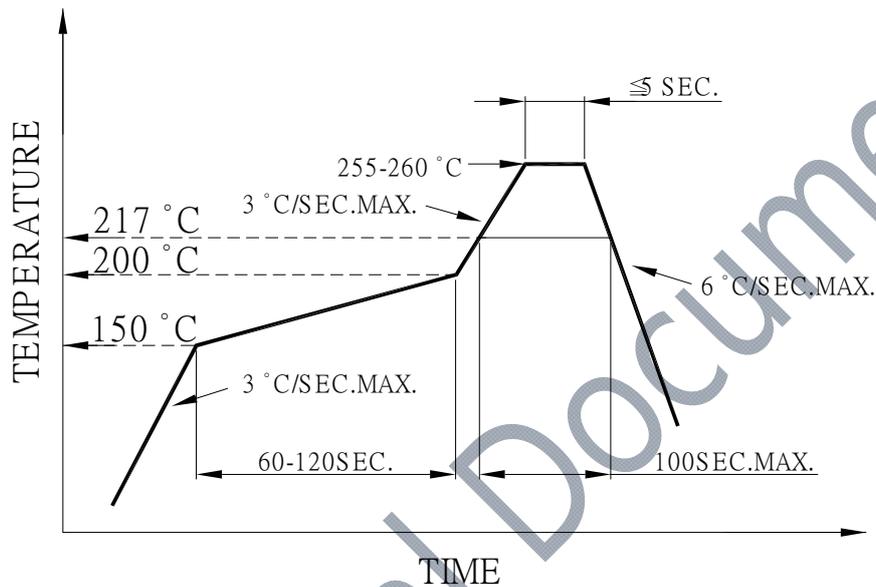


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● **SMT REFLOW SOLDERING INSTRUCTIONS**

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.



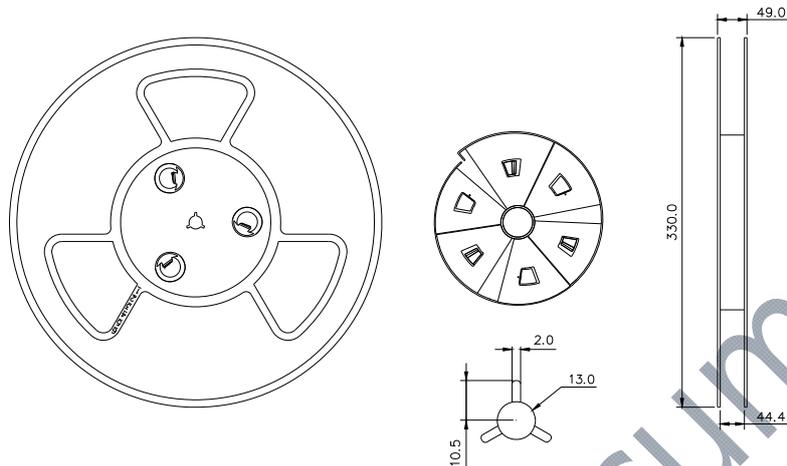
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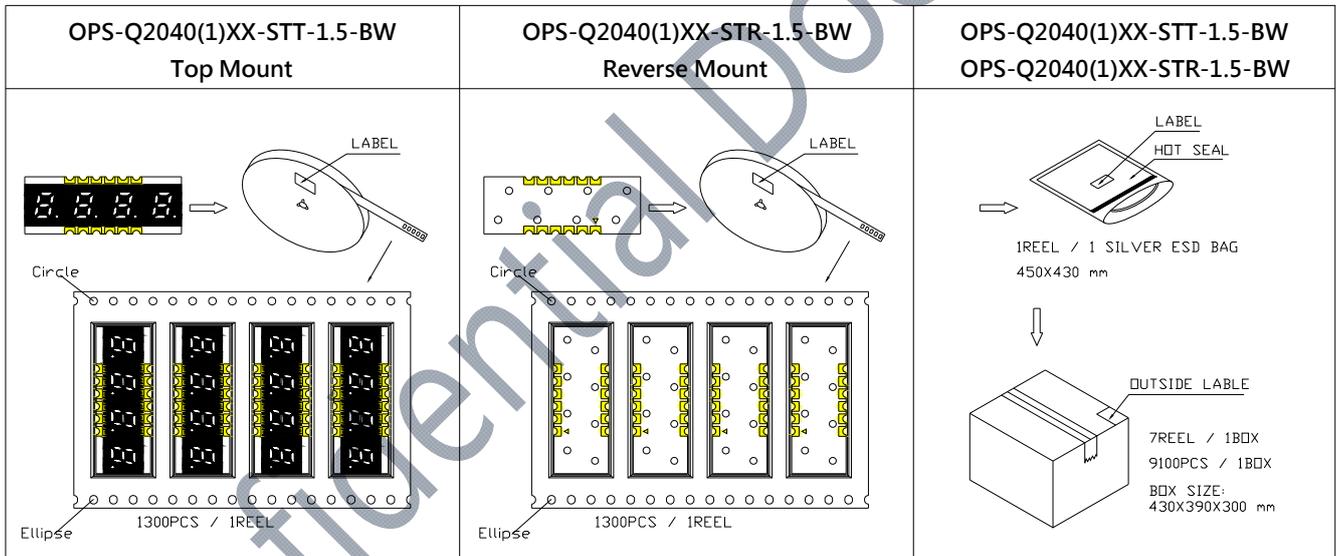
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### OPS-Q2041LR-STT(R)-1.5-G(B)W

#### ● 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)