![ORIENT-CHIP logo]

OC-VC series

Product Specification

Product	3535 VCSEL Emitter
Part Number	OCVC35-1290V9420-V6
Issue Date	2019/10/14
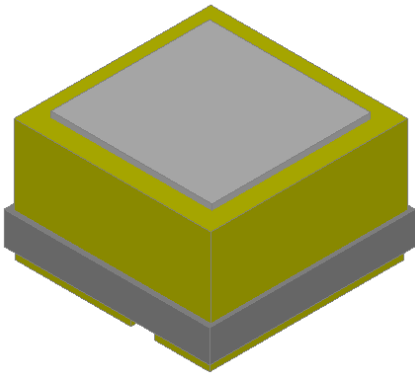
■ Features

- Vertical - Cavity Surface - Emitting Laser technology
- Package size = 3.5mm x 3.5mm x 1.6mm
- Pulse Output power 2W emitter
- Peak wavelength λ_p =940nm
- Divergence angles= 120°x90°
- Wavelength stabilized (0.07nm per °C)
- Narrow spectral width (<1nm)
- RoHS

■ Applications

- 3D depth sensing
- Gesture sensing
- Flood illuminator

Product Nomenclature

The product name is designated as below:

OCVCAB – CDEFGHIJK

Designation:

OCVC = Orient-Chip Technology Co., LTD VCSEL Series Product.
AB = Package size (1)
CDEF = Divergence Angle (2)
G = Internal Code
HI = Wavelength (3)
JK = Pulse mode Output Power (4)

Notes

1. Package Size:

Symbol	Description
35	3.5mm x 3.5mm

2. Divergence Angle:

Symbol	Description
4436	44° x 36°
5040	50° x 40°
6045	60° x 45°
7258	72° x 58°
9070	90° x 70°
1190	110° x 90°
1290	120° x 90°

3. Wavelength:

Symbol	Description
81	810nm
85	850nm
94	940nm

4. Pulse mode Output Power:

Symbol	Description
05	0.5W
10	1W
20	2W
30	3W
40	4W

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■ *Absolute Maximum Ratings*

Parameter	Symbol	Values	Unit
Operating temperature range	T_c	–20 ~ 85	°C
Storage temperature range	T_{stg}	–40 ~ 85	°C
Maximum package SMT solder Reflow temperature		260°C 10seconds	°C

■ *Characteristics(Ta = 25 °C)*

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Pulse Output power	P_o	$I_F = 3.0$ A	1900	2400	-	mW
Wavelength	λ_p	$I_F = 3.0$ A	930	940	950	nm
Forward Voltage	Vf	$I_F = 3.0$ A	1.7	2.0	2.3	V
Threshold current	I_{th}		-	500	-	mA
Power Conversion Efficiency	PCE	$I_F = 3.0$ A	-	34	-	%
Wave Shift	$\triangle\lambda/\triangle T$	$I_F = 3.0$ A	-	0.07	-	nm/°C
Slope Efficiency			-	0.96	-	W/A

■

Note:

1. Forward Voltage tolerance is ±0.1 V, Radiant Intensity tolerance is ±10%

    Others measurement allowance is ±10%.

2. VCSEL is mounted on PCB and measured with operating bias current @ 3A,10ms

3. Due to the special conditions of the manufacturing processes of VCSEL, the typical data of technical parameters can only reflect statistical figures. These do not necessarily correspond to the actual parameters of each single product, which could differ from the typical data or the typical characteristic line. If requested, e.g. because of technical improvements, these typ. data will be changed without any further notice.

■ *Radiometric Power Bin Structure at 3000mA*

Color	Bin Code	Minimum Radiometric Power (mW)	Typical Radiometric Power (mW)
Infrared 940	A2	1900	2400

- OCS maintains a tolerance of ±10% on flux and power measurements.
- The flux bin of the product may be modified for improvement without notice.

■ *Peak Wavelength Bin Structure at 3000mA*

Color	Bin Code	Centroid Wavelength
Infrared 940	94	940

■ *Forward Voltage Bin Structure at 3000mA*

Color	Bin Code	Typical Voltage (V)	Maximum Voltage (V)
Infrared 940	A1	2.0	2.3

- OCS maintain a tolerance of ±0.1V for Voltage measurements.

2019/10/14   V2

■ Divergence angles corresponds to the direction

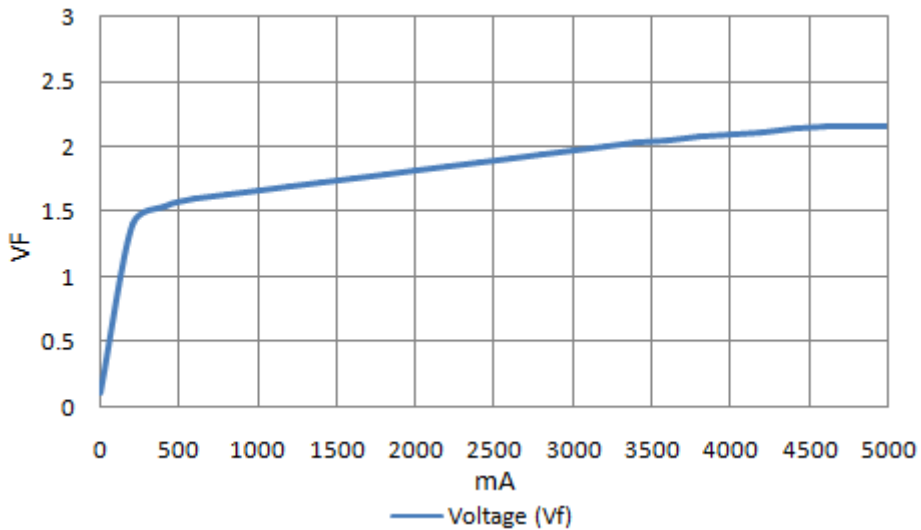

Anode

Bottom View

Cathode
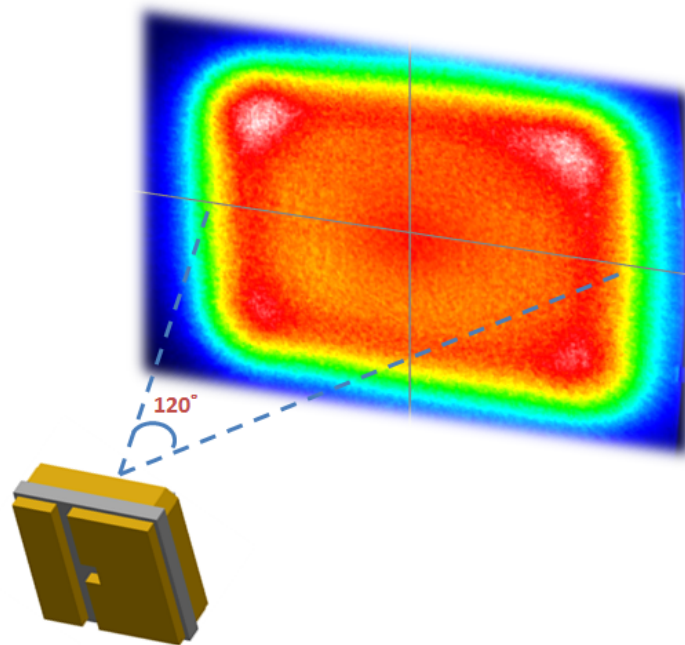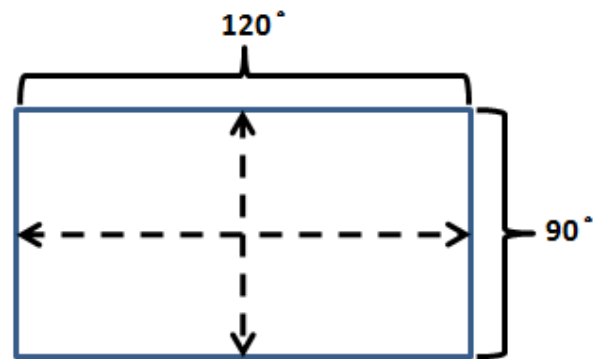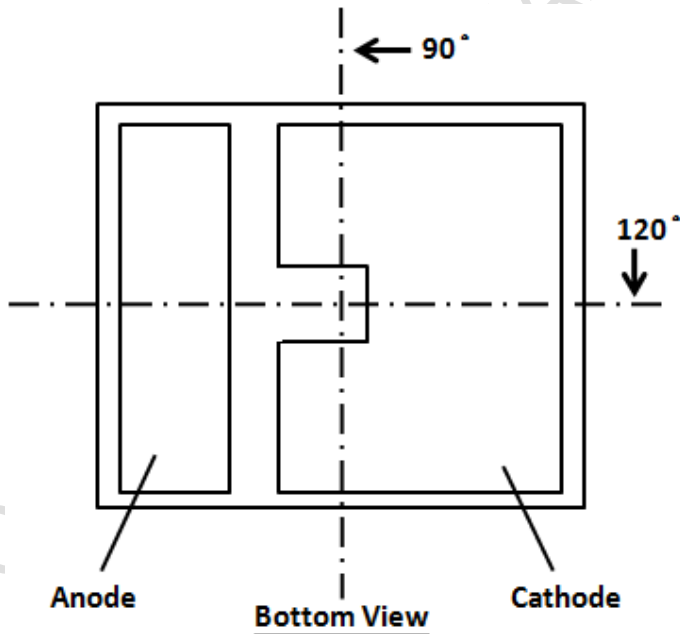
Divergence angles = 120x90±5˚
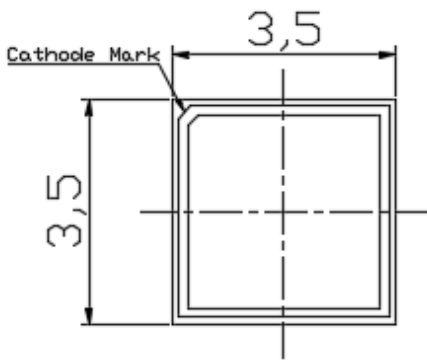
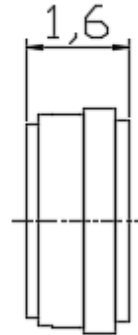# ■ Pulse Output Power vs. Forward Current
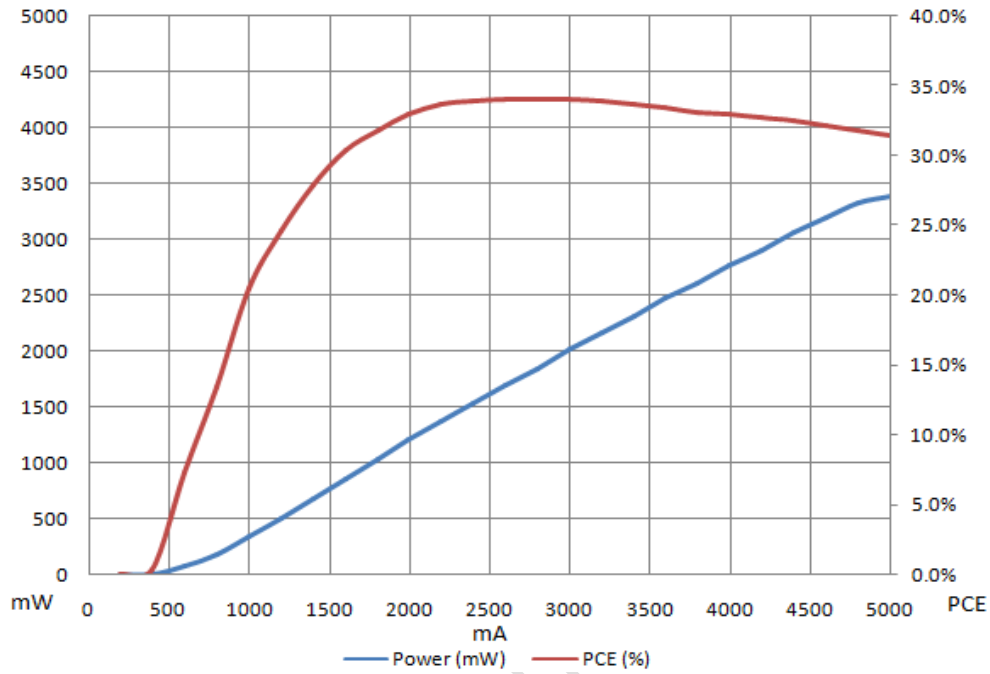
■ Forward Voltage vs. Forward Current
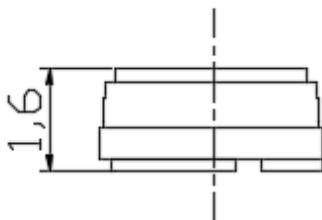
■ *Outline Dimension*
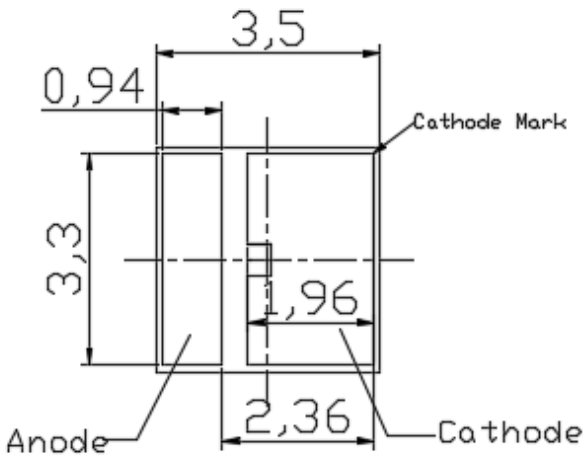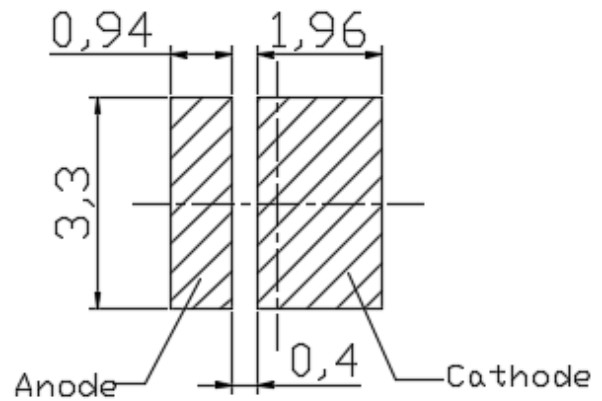

Top View

Side View

Side View

Polarity

Bottom View

Recommended Solder Pad

Unit: mm
Tolerance: ±0.1mm

■ *Cleaning*

1. If washing is required, recommend to use alcohol as a solvent.
2. Recommend to avoid cleaning the VCSEL by ultrasonic. If necessary, pre-test the VCSEL is necessary to confirm whether any damage occur after the process.

■ *Precautions for use*

1. Over-current-proof

1.1 Customer must apply resistors for protection; otherwise slight voltage shift will cause big current change (Burn out will happen).

2. Storage

2.1 Do not open moisture proof bag before the products are ready to use.

2.2 Before opening the package: The VCSEL should be kept at 30℃ or less and 90%RH or less.

2.3 After opening the package: The VCSEL floor life is 1 year under 30℃ or less and 60% RH or less. If unused VCSEL remain, it should be stored in moisture proof packages.

2.4 If the moisture absorbent material (silica gel) has faded away or the VCSEL have exceeded the storage time, baking treatment should be performed using the following conditions. Baking treatment: 60±5℃ for 24 hours.

3. Handling indications

3.1 During processing, mechanical stress on the surface should be minimized as much as possible. Sharp objects of all types should not be used to pierce the sealing compound. In general, VCSEL should only be handled at the housing. This also applies to VCSEL without a diffuser, since the surface can also become scratched.
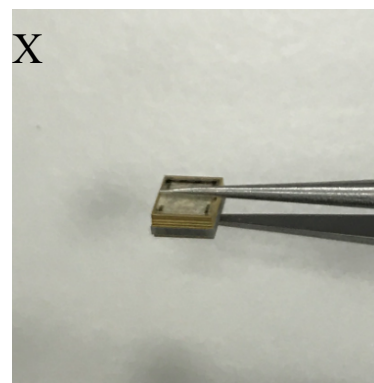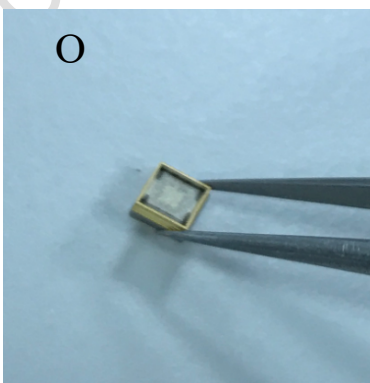
4. Soldering Condition

    4.1   Pb-free solder temperature profile
    (JEDEC-STD-020 latest version compliant)
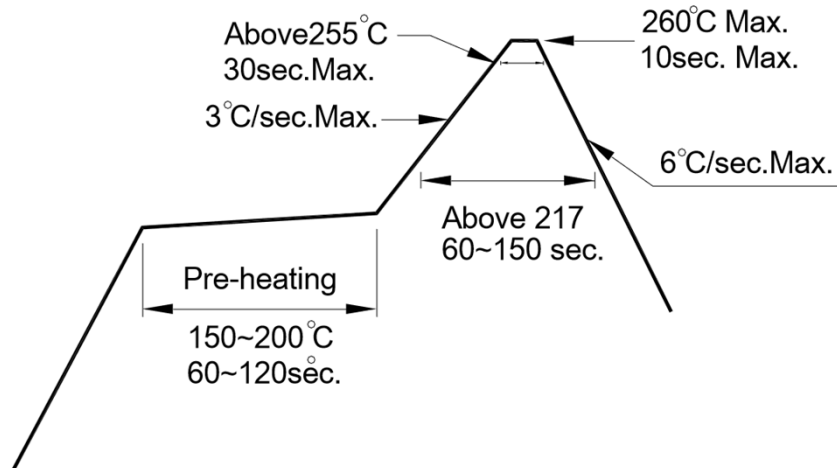
    4.2   Reflow soldering should not be done more than two times.
    4.3   When soldering, do not put stress on the VCSEL during heating.
    4.4   After soldering, do not warp the circuit board.

5. Soldering Iron

    5.1   Each terminal is to go to the tip of soldering iron temperature less than
           350℃ for 3 seconds within once in less than the soldering iron capacity
           25W. Leave two seconds and more intervals, and do soldering of each
           terminal. Be careful because the damage of the product is often started at
           the time of the hand solder.

6. Repairing

    6.1   Repair should not be done after the VCSEL have been soldered. When
           repairing is unavoidable, a double-head soldering iron should be used (as
           below figure). It should be confirmed beforehand whether the
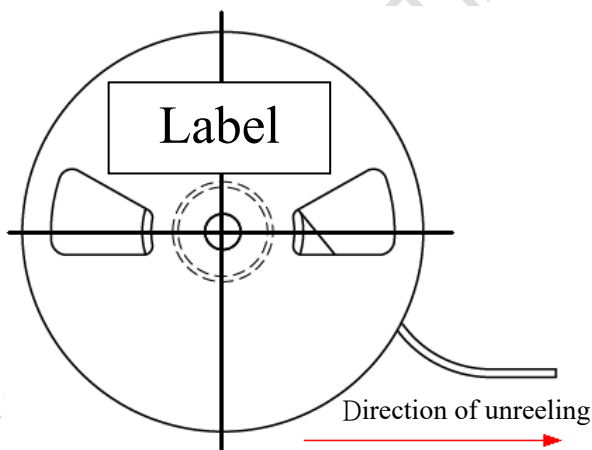   characteristics of the VCSEL will or will not be damaged by repairing.

■ *Carrier Taping*

VCSEL Anode Mark

Direction of unreeling

VCSEL Anode Mark

Cathode Mark
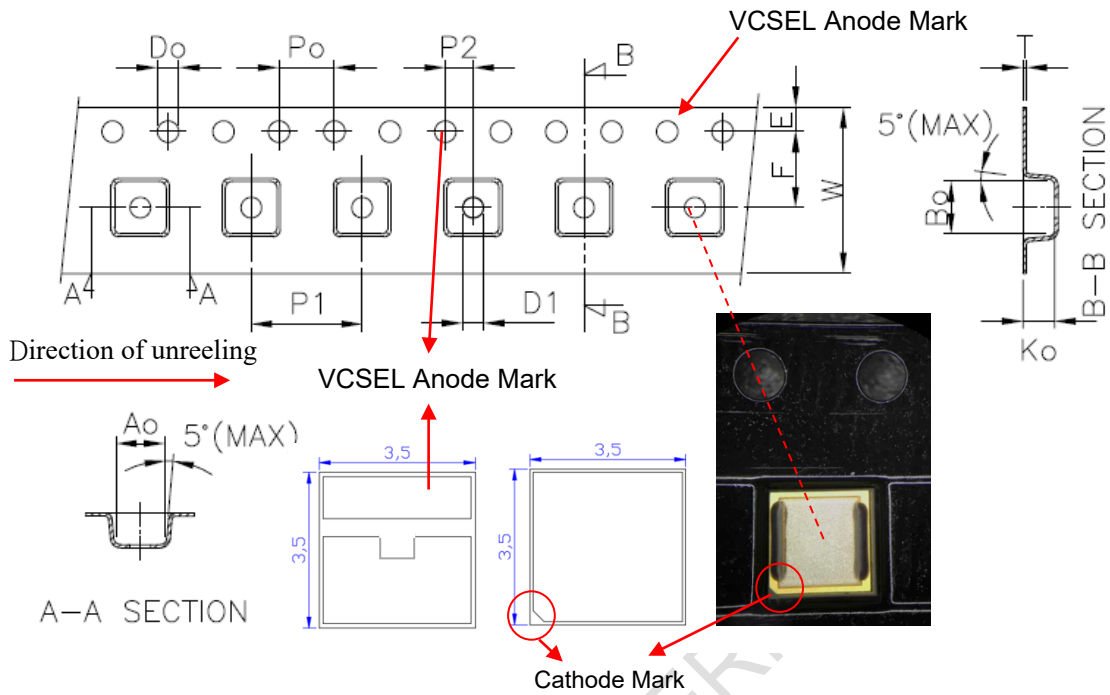
UNIT:mm

symbol	Ao	Bo	Ko	Po	P1	P2	T
spec	3.80±0.10	3.80±0.10	1.85±0.10	4.00±0.15	8.00±0.10	2.00±0.10	0.23±0.05
symbol	E	F	Do	D1	W	10Po	--
spec	1.75±0.10	5.5.±0.05	1.50+0.10	1.50±0.10	12.0±0.20	40.0±0.10	--

Label

Direction of unreeling

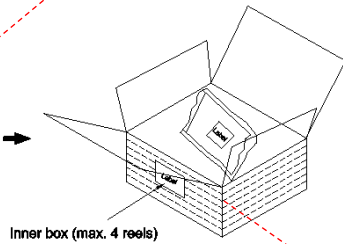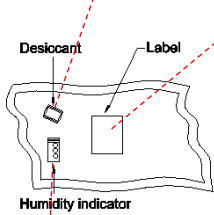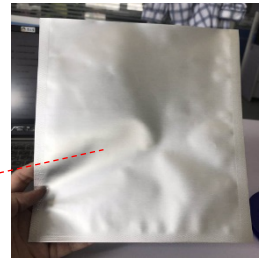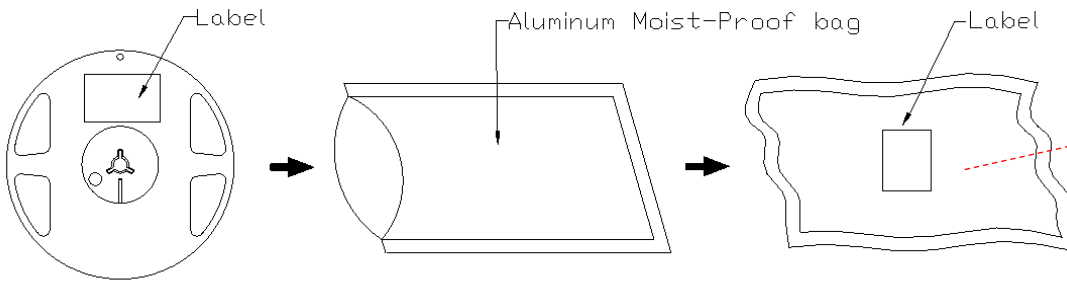7-inch Anti-Static Reel
Max 500pcs/reel

■ *Product Labeling*

- P/N: OCS Product Model Name
- LOT: Lot Number
- QTY: Q'ty
- BIN: mW/nm/Vf (ex.[A1/94/V1])
- DATE: Enter the warehouse

■ Moisture Resistant Packing

Label — Aluminum Moist-Proof bag — Label

Desiccant — Label — Humidity indicator — Inner box (max. 4 reels) — Outer box (max. 12 inner boxes) — Label

HUMIDITY INDICATOR Cobalt-Free LTP021

10% 20% 30% 40% 50% 60%

DANGER IF AZURE
CHANGE DESICCANT   BROWN-DRY AZURE-WET
AVOID METAL CONTACT
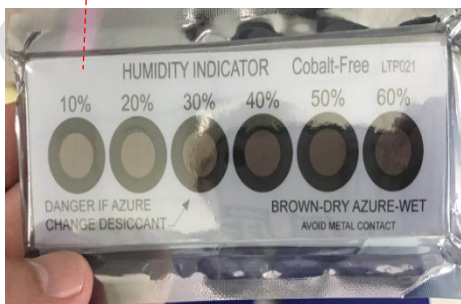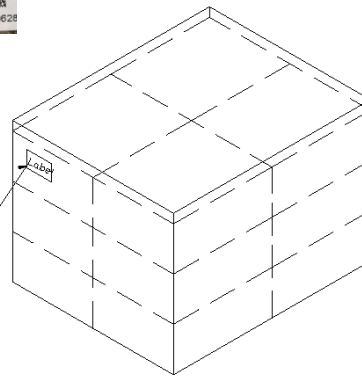
■ *Modified records*

Version	Description	Issue Date
V0	New spec	2019/03/20
V1	Add Ith, Slope	2019/10/05
V2	Update spec	2019/10/14