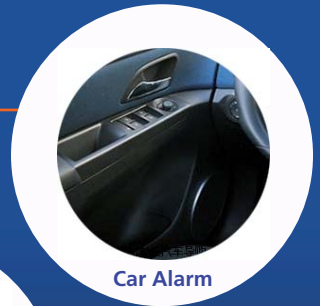


# SENSOR SWITCHES

- >> Small size & compact space
- >> Increased strength between housing and base
- >> High temperature and fire proof
- >> Suitable to IC trigger signal
- >> Complete replacement of mercury switches
- >> Meet environmental protection
- >> RoHS compliant

## Vibration Sensor Switches

NV1 Series



NV2 Series



NV3 Series



NV4 Series

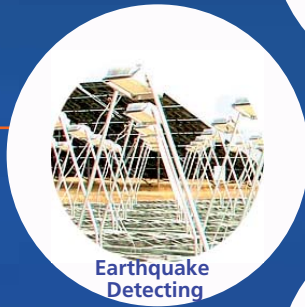


## Roll Ball Sensor Switches

NR1 Series



NR2 Series

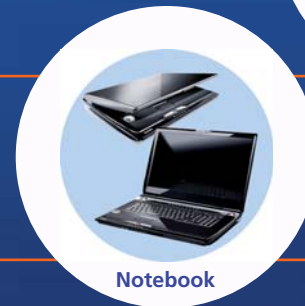


NR3 Series



## Optical Roll Ball Sensor Switches

NP1 Series



NP2 Series

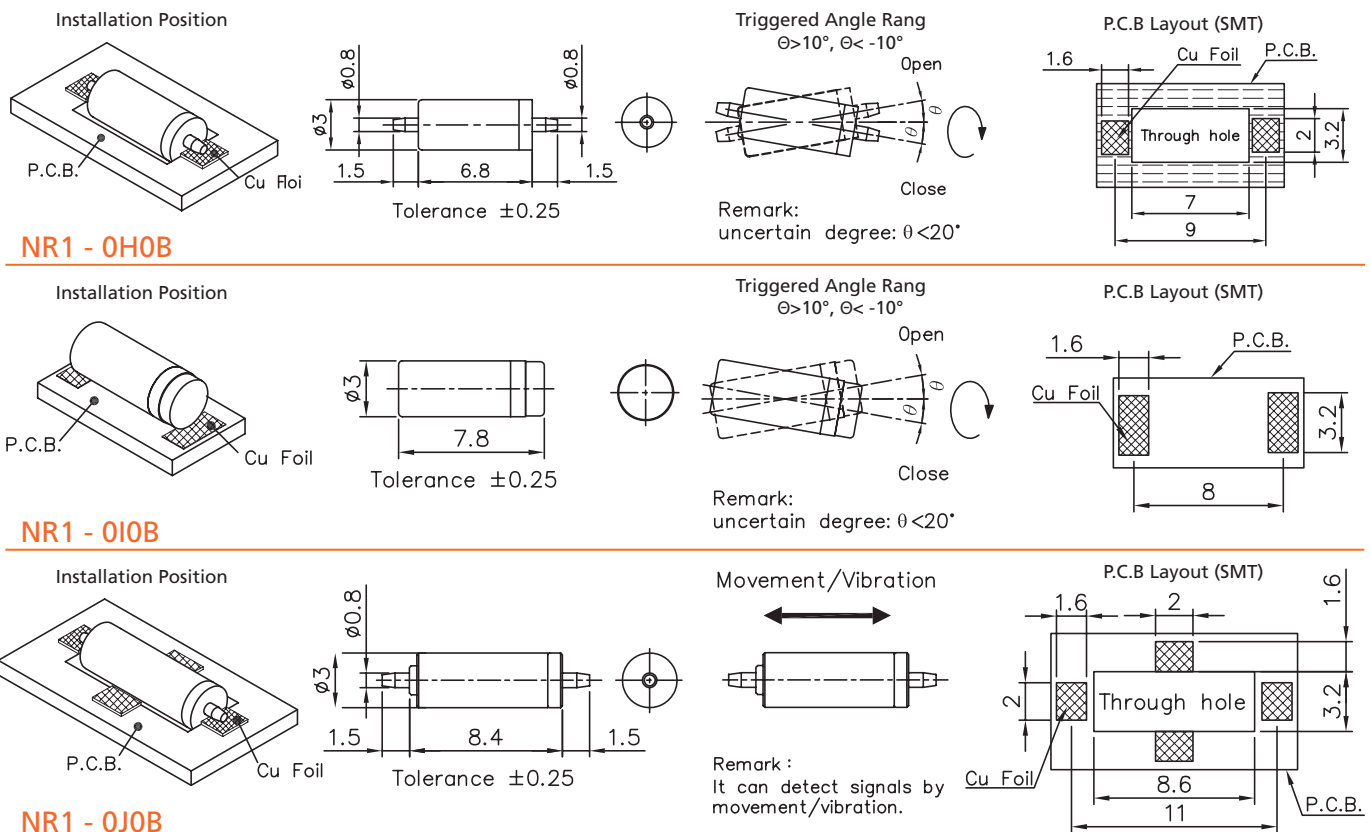




### Applications:

1. Horizontal Tilt Detecting: Digital Picture Frames
2. Vertical Rotation Detecting: Digital Camera
3. Shock Detecting: Tracing Equipment

### Dimensions/ Operation/ P.C.B. Layout(Unit: mm,Tolerance:±0.25mm)



### GENERAL SPECIFICATIONS

#### Features:

1. Minutaneous size, compact space, and innovation wing-types terminal designed, making install space minimum above the print circuit board.
2. Special structures which increase strength between housing and base, offering perfect appearance.
3. Terminals and balls gold plated to enhance the life
4. Suitable to IC trigger signal.
5. Complete replacement of mercury switch and meet with environmental protection.

#### Bill Of Material:

1. Housing: Copper Alloy, Tin Plated over Nickel or Gold Plated(3μ") over Nickel
2. Isolation Base: Class-Fiber Polyamide, UL 94-0
3. Terminal: Copper Alloy, Gold Plated(3μ") over Nickel
4. Ball: Copper Alloy, Gold Plated(10μ") over Nickel

#### Electrical Characteristics:

1. Contact Rating: 25mA, 24VDC
2. Contact Resistance: 10Ω max
3. Insulation Resistance: 1000MΩ min. At 100VDC
4. Differential Angle: Refer to the drawing
5. Dielectric Strength: 500 VDC min. for 1 minute
6. Capacitance: 5pF max

#### Mechanical Characteristics:

1. Temperature Range: Operating: -25°C to +85°C ; Storage : -40°C to +85°C
2. Pull Force of Terminal: 500 gf for 1 minute
3. Operation Life: 100,000 Cycles
4. Conductive Rate (Switch-on Rate): min. over 90%
5. Humidity: 95% RH, 40°C for 96 hrs.
6. Solder ability : After flux 260±5°C for 5±0.5 seconds 95% coverage
7. Reflow Soldering Heat for SMT type: Reflow zone 260±5° for 20 seconds max.

### » NOTE

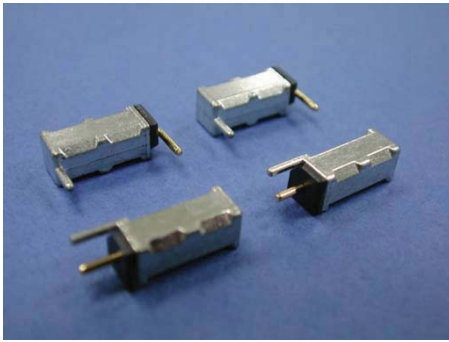
1. Suggestion for Application: Application in occasions that require vibration functions, adding design of "ON DELAY" is recommended. For great vibration, Optical type Products are recommended.
2. Suggestion Contact Rating: 5 mA.
3. Conductive Rate: To test the conductivity (Switch-on Rate) of one switch individually for 100 times, if the switch conductive 95 times, we call the "conductive rate" is 95%.
4. For the continued product improvement as one of the company policy, specifications may change or update without notice. The latest information can be obtained through our sales offices. Normally, all products are supplied under our standard conditions.

### » PRECAUTIONS FOR USE

1. The product is used mainly in electronic devices such as automotive devices, visual devices, home electrical appliances, information devices and communication settings. If the products is intended to be used for other endurance equipments requiring higher safety and reliability such as life support system, space and aviations devices, disaster and safety system, it's necessary to make verification of conformity or contact us for the details before using.
2. Don't try to clean the switch with a solvent or similar substance after the soldering Prozess.
3. The switch might be damaged if using the water-soluble flux.
4. The switch might be apart if the soldering condition over specification.
5. Don't use the switch in the environment with high humidity or other bedewing possibility, as it may cause leaking among the terminals.
6. It might catch fire if the rating exceeds the specifications. Never use the switch beyond the Rating.

#### PACKAGE (Minimum Order Quantity: One Bag / One Reel)

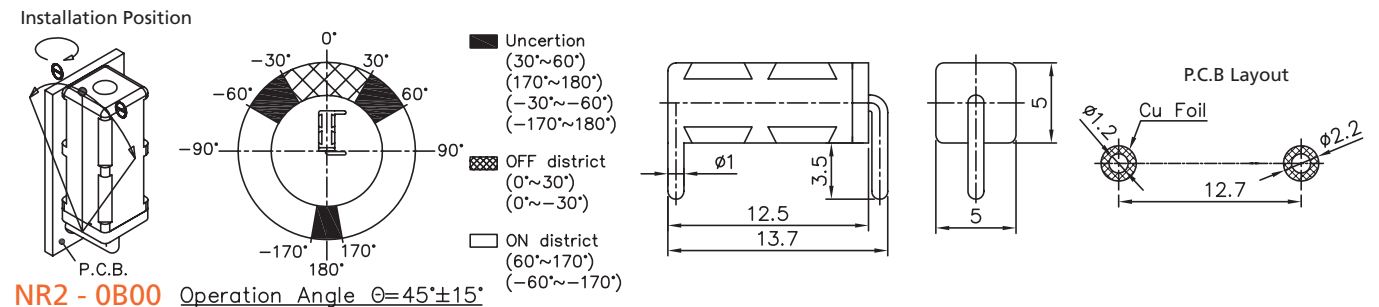
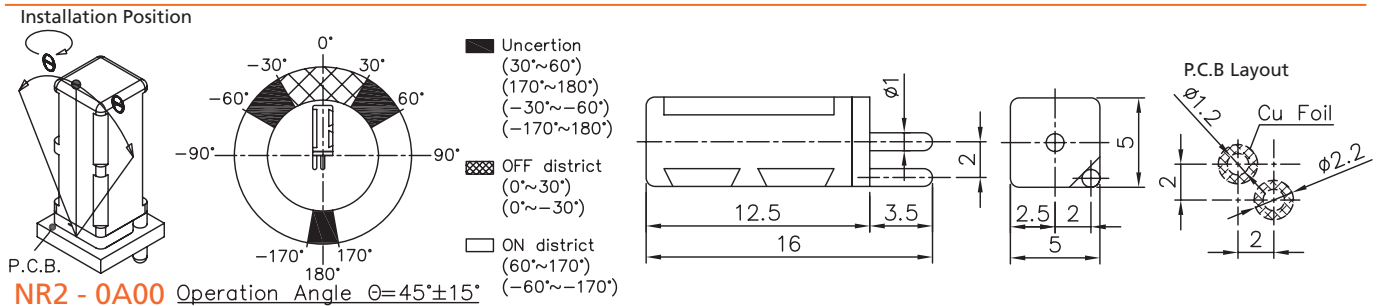
	Part Number	Package	Quantity	Total	Size
2.	NR1-0H0B	PE Bag	2,000 pcs	2,000 pcs	12.7 x 17.8 cm
	NR1-0I0B	Inner Box	10 Bags	20,000 pcs	36 x 20 x 9 cm
	NR1-0J0B	Carton	3 Boxes	60,000 pcs	36 x 28 x 23 cm
3.	NR1-0I0BT	Reel	2,500 pcs	2,500 pcs	30 x 30 cm
		Inner Box	2 Reels	5,000 pcs	36 x 34 x 7 cm
		Carton	4 Boxes	20,000 pcs	37 x 37 x 28 cm



### Applications:

- 45° Tilt Detecting within a 360° radius:  
Home Appliance Tilt Off function

### Dimensions/ Operation/ P.C.B. Layout(Unit:mm,Tolerance: ±0.25mm)



### GENERAL SPECIFICATIONS

#### Features:

- Small size & compact space.
- Tip-over switch.
- Balls are gold plated to enhance the life.
- All plastic material subject to industrial purpose meets high temperature and fireproof function
- Suitable to IC trigger signal.
- Complete replacement of mercury switch and meet with environmental protection

#### Bill Of Material:

- Housing: ZINC Alloy, Tin Plated over Nickel
- Cover: Class-Fiber Polyamide
- Terminal: Copper Alloy, Gold Plated(3μ") over Nickel
- Ball: Copper Alloy, Gold Plated(3μ") over Nickel
- Steel Ball: Stainless Steel

#### Electrical Characteristics:

- Contact Rating: 25mA, 24VDC
- Contact Resistance: 100Ω max
- Insulation Resistance: 1000MΩ min. At 100VDC
- Differential Angle: Refer to the drawing
- Dielectric Strength: 500 VDC min. for 1 minute
- Capacitance: 5pF max
- Switching type: Normal Open(NO)

#### Mechanical Characteristics:

- Temperature Range: Operating: -25°C to +85°C ;  
Storage: -40°C to +85°C
- Pull Force of Terminal: 500 gf for 1 minute
- Operation Life: 100,000 Cycles
- Conductive Rate (Switch-on Rate): min. over 90%
- Humidity: 95% RH, 40°C for 96 hrs.
- Solder ability : After flux 245±5°C for 5±0.5 seconds  
95% coverage

### » NOTE

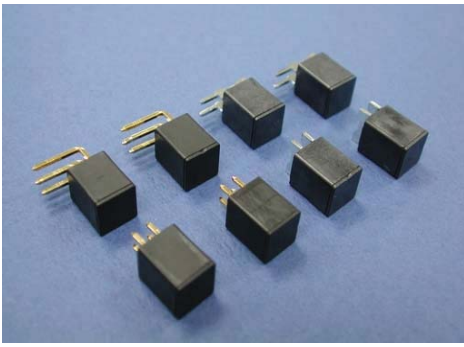
1. Suggestion for Application : Application in occasions that require vibration functions, adding design of "ON DELAY" is recommended. For great vibration, Optical type products are recommended.
2. Suggestion Contact Rating: 5 mA.
3. Conductive Rate: To test the conductivity (Switch-on Rate) of one switch individually for 100 times, if the switch conductive 95 times, we call the "conductive rate" is 95%.
4. Switches will provide pulse at tilt angle but the signal will not be a continued state after tilt angle.
5. For the continued product improvement as one of the company policy, specifications may change or update without notice. The latest information can be obtained through our sales offices. Normally, all products are supplied under our standard conditions.

### » PRECAUTIONS FOR USE

1. The product is used mainly in electronic devices such as automotive devices, visual devices, home electrical appliances, information devices and communication settings. If the products is intended to be used for other endurance equipments requiring higher safety and reliability such as life support system, space and aviations devices, disaster and safety system, it's necessary to make verification of conformity or contact us for the details before using.
2. Don't try to clean the switch with a solvent or similar substance after the soldering process.
3. The switch might be damaged if using the water-soluble flux.
4. Don't use the switch in the environment with high humidity or other bedewing possibility, as it may cause leaking among the terminals.
5. It might catch fire if the rating exceeds the specifications. Never use the switch beyond the rating.

### PACKAGE (Minimum Order Quantity: One Bag)

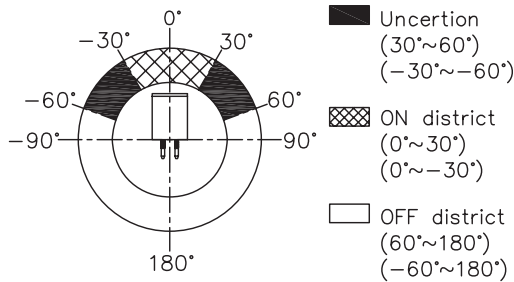
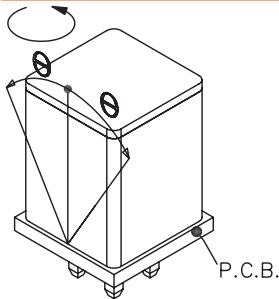
	Part Number	Package	Quantity	Total	Size
1.	NR2 - 0A00 NR2 - 0B00	PE Bag	500 pcs	500 pcs	12.7 x 17.8 cm
		Inner Box	10 Bags	5,000 pcs	36 x 20 x 9 cm
		Carton	3 Boxes	15,000 pcs	36 x 28 x 23 cm



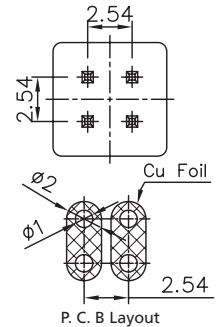
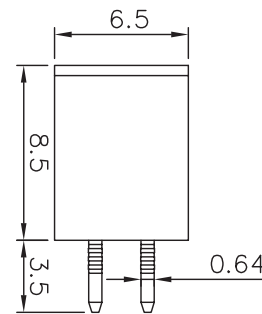
### Applications:

- 45° Tilt Detecting within a 360° radius:  
Xbox 360, Exsiccaters, Home Appliance Tilt Off function.

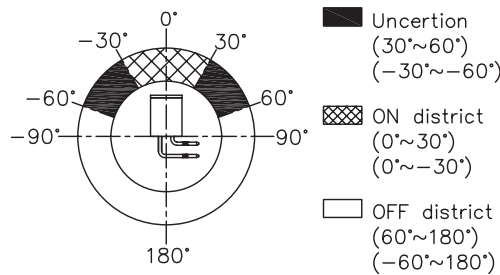
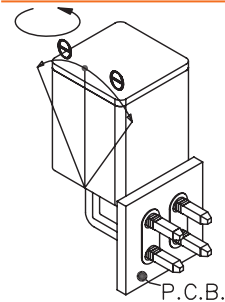
Dimensions/ Operation/ P.C.B. Layout (Unit:mm,Tolerance: ±0.25mm)



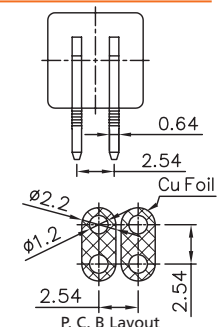
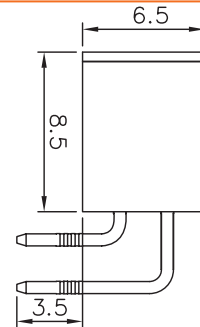
Operation Angle  $\Theta=45^{\circ}\pm 15^{\circ}$



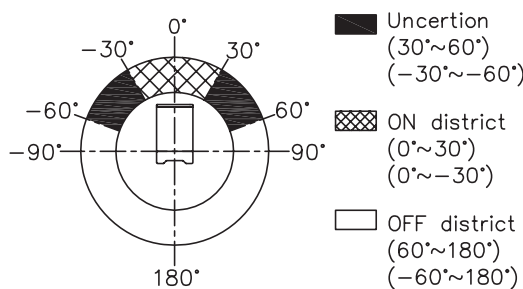
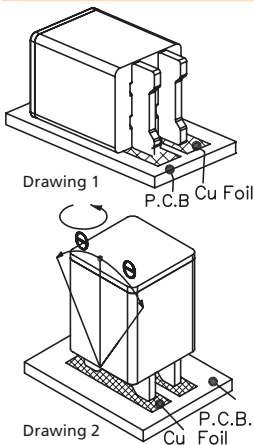
NR3 - 0CA0



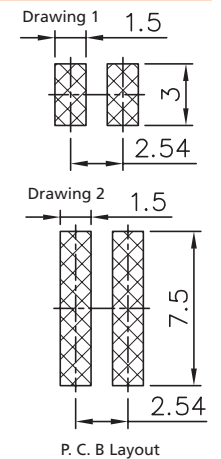
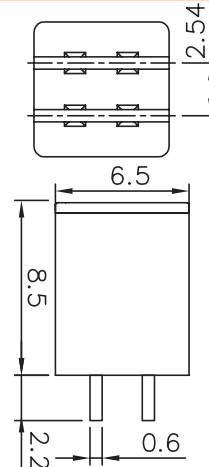
Operation Angle  $\Theta=45^{\circ}\pm 15^{\circ}$



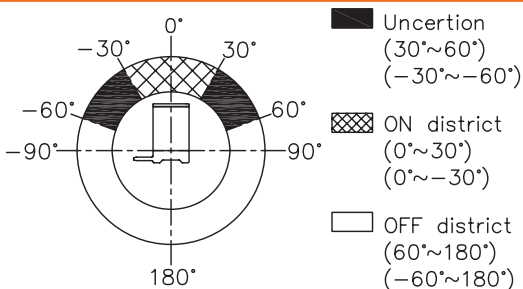
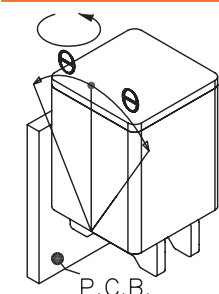
NR3 - 0DA0



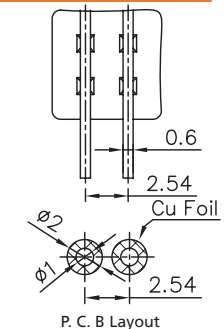
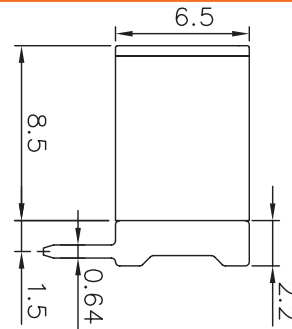
Operation Angle  $\Theta=45^{\circ}\pm 15^{\circ}$



NR3 - 0E00



Operation Angle  $\Theta=45^{\circ}\pm 15^{\circ}$



NR3 - 0F00

### GENERAL SPECIFICATIONS

#### Features:

1. Small size & compact space.
2. Housing made of high insulation plastic material, free from electric conduction and rust problem.
3. Terminal and balls are gold plated to enhance the life.
4. All plastic material subject to industrial purpose high temperature and fireproof function
5. Suitable to IC trigger signal.
6. Complete replacement of mercury switch and meet with environmental protection

#### Electrical Characteristics:

1. Contact Rating: 25mA, 24VDC
2. Contact Resistance: Initial:5Ω  
After Life Test:10Ω max
3. Insulation Resistance:1000MΩ min. At 100VDC
4. Differential Angle: Refer to the drawing
5. Dielectric Strength: 500 VDC min. for 1 minute
6. Capacitance: 5pF max
7. Switching type: Normal Close (NC)

#### Mechanical Characteristics:

1. Temperature Range: Operating: -25°C to +85°C ;  
Storage : -40°C to +85°C
2. Pull Force of Terminal: 500 gf for 1 minute
3. Operation Life: 100,000 Cycles
4. Conductive Rate (Switch-on Rate): min. over 90%
5. Humidity: 95% RH,40°C for 96 hrs.
6. Solder ability : After flux 260±5°C for 5±0.5 seconds  
95% coverage
7. Reflow Soldering Heat for SMT type(for NR30E00):  
Reflow zone 260±5°C for 20 seconds max.

#### Bill Of Material:

1. Housing: Glass-Fiber Polyamide(NR3-0C/DA0)  
Glass-Fiber Liquid crystal polymer(NR3-0E/F00)
2. Terminal: Copper Alloy, Gold Plated(3μ") over Nickel
3. Ball: Copper Alloy, Gold Plated(3μ") over Nickel

#### » NOTE

1. Suggestion Contact Rating: 5 mA.
2. For the continued product improvement as one of the company policy, specifications may change or update without notice. The latest information can be obtained through our sales offices. Normally, all products are supplied under our standard conditions.

#### » PRECAUTIONS FOR USE

1. The product is used mainly in electronic devices such as automotive devices, visual devices, home electrical appliances, information devices and communication settings. If the products is intended to be used for other endurance equipments requiring higher safety and reliability such as life support system, space and aviations devices, disaster and safety system, it's necessary to make verification of conformity or contact us for the details before using.
2. Don't try to clean the switch with a solvent or similar substance after the soldering Prozess.
3. The switch might be damaged if using the water-soluble flux.
4. The switch might be apart if the soldering condition over specification.
5. Don't use the switch in the environment with high humidity or other bedewing possibility, as it may cause leaking among the terminals.
6. It might catch fire if the rating exceeds the specifications. Never use the switch beyond the Rating.

#### PACKAGE (Minimum Order Quantity: One Bag)

	Part Number	Package	Quantity	Total	Size
1.	NR3-0CA0	PE Bag	500 pcs	500 pcs	12.7 x 17.8 cm
		Inner Box	10 Bags	5,000 pcs	36 x 20 x 9 cm
		Carton	3 Boxes	15,000 pcs	36 x 28 x 23 cm
2.	NR3-0DA0 NR3-0E00 NR3-0F00	PE Bag	500 pcs	500 pcs	12.7 x 17.8 cm
		Inner Box	8 Bags	4,000 pcs	36 x 20 x 9 cm
		Carton	3 Boxes	12,000 pcs	36 x 28 x 23 cm
3.	NR3-0E00	Reel	750pcs	750pcs	30 x 30 cm
		Inner Box	2 Reels	1,500 pcs	36 x 34 x 7 cm
		Carton	4 Boxes	6,000 pcs	37 x 37 x 28 cm