

## Thin Film Precision Chip Resistor (AR Series)

### ■ Features

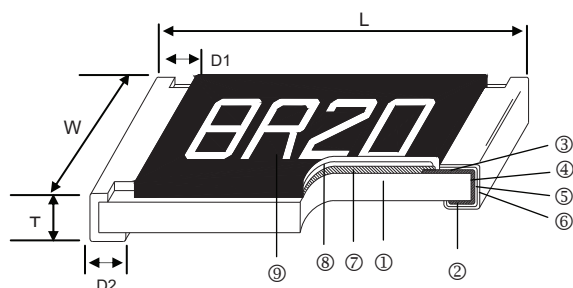
- Advanced thin film technology
- Very tight tolerance down to  $\pm 0.01\%$
- Extremely low TCR down to  $\pm 5\text{PPM}/^\circ\text{C}$
- Wide resistance range 1ohm ~ 3Mega ohm
- Miniature size 0201 available

### ■ Applications

- Medical Equipment
- Testing / Measurement Equipment
- Printer Equipment
- Automatic Equipment Controller
- Converters
- Communication Device, Cell Phone, GPS, PDA



### ■ Construction



|                         |                           |                         |
|-------------------------|---------------------------|-------------------------|
| ① Alumina Substrate     | ③ Edge Electrode (NiCr)   | ⑤ Resistor Layer (NiCr) |
| ② Bottom Electrode (Ag) | ④ Barrier Layer (Ni)      | ⑥ Overcoat (Epoxy)      |
| ③ Top Electrode (Ag-Pd) | ⑥ External Electrode (Sn) | ⑨ Marking               |

### ■ Dimensions

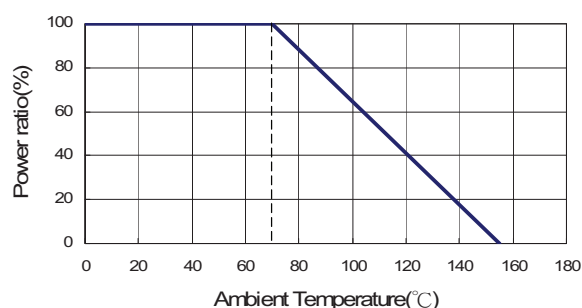
Unit: mm

| Type | Size (Inch) | L               | W               | T               | D1              | D2              | Weight (g) (1000pcs) |
|------|-------------|-----------------|-----------------|-----------------|-----------------|-----------------|----------------------|
| AR01 | 0201        | 0.58 $\pm$ 0.05 | 0.29 $\pm$ 0.05 | 0.23 $\pm$ 0.05 | 0.12 $\pm$ 0.05 | 0.15 $\pm$ 0.05 | 0.14                 |
| AR02 | 0402        | 1.00 $\pm$ 0.05 | 0.50 $\pm$ 0.05 | 0.30 $\pm$ 0.05 | 0.20 $\pm$ 0.10 | 0.20 $\pm$ 0.10 | 0.54                 |
| AR03 | 0603        | 1.55 $\pm$ 0.10 | 0.80 $\pm$ 0.10 | 0.45 $\pm$ 0.10 | 0.30 $\pm$ 0.20 | 0.30 $\pm$ 0.20 | 1.83                 |
| AR05 | 0805        | 2.00 $\pm$ 0.15 | 1.25 $\pm$ 0.15 | 0.55 $\pm$ 0.10 | 0.30 $\pm$ 0.20 | 0.40 $\pm$ 0.25 | 4.71                 |
| AR06 | 1206        | 3.05 $\pm$ 0.15 | 1.55 $\pm$ 0.15 | 0.55 $\pm$ 0.10 | 0.42 $\pm$ 0.20 | 0.35 $\pm$ 0.25 | 9.02                 |
| AR13 | 1210        | 3.10 $\pm$ 0.15 | 2.40 $\pm$ 0.15 | 0.55 $\pm$ 0.10 | 0.40 $\pm$ 0.20 | 0.55 $\pm$ 0.25 | 10                   |
| AR10 | 2010        | 4.90 $\pm$ 0.15 | 2.40 $\pm$ 0.15 | 0.55 $\pm$ 0.10 | 0.60 $\pm$ 0.30 | 0.50 $\pm$ 0.25 | 23.61                |
| AR12 | 2512        | 6.30 $\pm$ 0.15 | 3.10 $\pm$ 0.15 | 0.55 $\pm$ 0.10 | 0.60 $\pm$ 0.30 | 0.50 $\pm$ 0.25 | 38.06                |

## Part Numbering

| AR           | 03                                                                                           | T                                                                     | T                         | B                                             | Y                                                                                                             | 1001                                             | N                                                 |
|--------------|----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|---------------------------|-----------------------------------------------|---------------------------------------------------------------------------------------------------------------|--------------------------------------------------|---------------------------------------------------|
| Product Type | Dimensions (L×W)                                                                             | Resistance Tolerance                                                  | Packaging Code            | TCR (PPM/°C)                                  | Power Rating                                                                                                  | Resistance                                       | Marking Code                                      |
|              | 01: 0201<br>02: 0402<br>03: 0603<br>05: 0805<br>06: 1206<br>13: 1210<br>10: 2010<br>12: 2512 | T: ±0.01%<br>A: ±0.05%<br>B: ±0.1%<br>C: ±0.25%<br>D: ±0.5%<br>F: ±1% | T: Taping Reel<br>B: Bulk | S: ±5<br>B: ±10<br>N: ±15<br>C: ±25<br>D: ±50 | : Standard<br>Y: 1/16W<br>X: 1/10W<br>W: 1/8W<br>M: 1/6W<br>P: 1/5W<br>V: 1/4W<br>O: 1/3W<br>U: 1/2W<br>T: 1W | 0010: 1Ω<br>4R70: 4.7Ω<br>1001: 1KΩ<br>1004: 1MΩ | : Standard Marking for E96 / E24<br>N: No Marking |

## Derating Curve



## Standard Electrical Specifications

| Item<br>Type | Power Rating at 70°C | Operating Temp. Range | Max. Operating Voltage | Max. Overload Voltage | Resistance Range |              |            |       |              | TCR (PPM/°C) |
|--------------|----------------------|-----------------------|------------------------|-----------------------|------------------|--------------|------------|-------|--------------|--------------|
|              |                      |                       |                        |                       | ±0.05%           | ±0.1%        | ±0.25%     | ±0.5% | ±1%          |              |
| AR01 (0201)  | 1/32W                | -55 ~ +155°C          | 15V                    | 30V                   | —                |              |            |       | 49.9Ω - 5KΩ  | ±25<br>±50   |
|              |                      |                       |                        |                       |                  |              |            |       | 49.9Ω - 33KΩ | ±50          |
| AR02 (0402)  | 1/16W                | -55 ~ +155°C          | 25V                    | 50V                   | —                | 10Ω - 205KΩ  |            |       |              | ±25<br>±50   |
| AR03 (0603)  | 1/16W                | -55 ~ +155°C          | 50V                    | 100V                  | 4.7Ω - 332KΩ     | 4.7Ω - 1MΩ   | 2Ω - 1MΩ   |       |              | ±25<br>±50   |
| AR05 (0805)  | 1/10W                | -55 ~ +155°C          | 100V                   | 200V                  | 4.7Ω - 511KΩ     | 4.7Ω - 2MΩ   | 1Ω - 2MΩ   |       |              | ±25<br>±50   |
| AR06 (1206)  | 1/8W                 | -55 ~ +155°C          | 150V                   | 300V                  | 4.7Ω - 1MΩ       | 4.7Ω - 2.5MΩ | 1Ω - 2.5MΩ |       |              | ±25<br>±50   |
| AR13 (1210)  | 1/5W                 | -55 ~ +155°C          | 150V                   | 300V                  | 4.7Ω - 1MΩ       | 4.7Ω - 2.5MΩ | 1Ω - 2.5MΩ |       |              | ±25<br>±50   |
| AR10 (2010)  | 1/4W                 | -55 ~ +155°C          | 150V                   | 300V                  | 4.7Ω - 1MΩ       | 4.7Ω - 3MΩ   | 1Ω - 3MΩ   |       |              | ±25<br>±50   |
| AR12 (2512)  | 1/2W                 |                       |                        |                       |                  |              |            |       |              |              |

Operating Voltage= $\sqrt{P \cdot R}$  or Max. operating voltage listed above, whichever is lower.

Overload Voltage= $2.5 \cdot \sqrt{P \cdot R}$  or Max. overload voltage listed above, whichever is lower.

■ Viking is capable of manufacturing the optional spec based on customer's requirement.

■ Lower Resistance: 1~10Ω

## Special Electrical Specifications

| Item<br>Type | Power<br>Rating<br>at 70°C | Operating<br>Temp. Range | Max.<br>Operating<br>Voltage | Max.<br>Overload<br>Voltage | Resistance Range |        |       | TCR<br>(PPM/°C) |
|--------------|----------------------------|--------------------------|------------------------------|-----------------------------|------------------|--------|-------|-----------------|
|              |                            |                          |                              |                             | ±0.01%           | ±0.05% | ±0.1% |                 |
| AR02 (0402)  | 1/16W                      | -55 ~ +155°C             | 25V                          | 50V                         | 49.9Ω - 5KΩ      |        |       | ±5              |
|              |                            |                          |                              |                             | 49.9Ω - 12KΩ     |        |       | ±10<br>±15      |
|              |                            |                          |                              |                             | — 49.9Ω - 70KΩ   |        |       | ±15             |
| AR03 (0603)  | 1/16W                      | -55 ~ +155°C             | 50V                          | 100V                        | 24.9Ω - 15KΩ     |        |       | ±5              |
|              |                            |                          |                              |                             | 24.9Ω - 100KΩ    |        |       | ±10<br>±15      |
|              |                            |                          |                              |                             | — 4.7Ω - 332KΩ   |        |       | ±15             |
| AR05 (0805)  | 1/10W                      | -55 ~ +155°C             | 100V                         | 200V                        | 24.9Ω - 30KΩ     |        |       | ±5              |
|              |                            |                          |                              |                             | 24.9Ω - 200KΩ    |        |       | ±10<br>±15      |
|              |                            |                          |                              |                             | — 4.7Ω - 511KΩ   |        |       | ±15             |
| AR06 (1206)  | 1/8W                       | -55 ~ +155°C             | 150V                         | 300V                        | 24.9Ω - 50KΩ     |        |       | ±5              |
|              |                            |                          |                              |                             | 24.9Ω - 500KΩ    |        |       | ±10<br>±15      |
|              |                            |                          |                              |                             | — 4.7Ω - 1MΩ     |        |       | ±15             |
| AR13 (1210)  | 1/ 5W                      | -55 ~ +155°C             | 150V                         | 300V                        | 24.9Ω - 50KΩ     |        |       | ±5              |
|              |                            |                          |                              |                             | 24.9Ω - 500KΩ    |        |       | ±10<br>±15      |
|              |                            |                          |                              |                             | — 4.7Ω - 1MΩ     |        |       | ±15             |
| AR10 (2010)  | 1/4W                       | -55 ~ +155°C             | 150V                         | 300V                        | 24.9Ω - 100KΩ    |        |       | ±5              |
|              |                            |                          |                              |                             | 24.9Ω - 500KΩ    |        |       | ±10<br>±15      |
|              |                            |                          |                              |                             | — 4.7Ω - 1MΩ     |        |       | ±15             |
| AR12 (2512)  | 1/2W                       | -55 ~ +155°C             | 150V                         | 300V                        | 24.9Ω - 100KΩ    |        |       | ±5              |
|              |                            |                          |                              |                             | 24.9Ω - 500KΩ    |        |       | ±10<br>±15      |
|              |                            |                          |                              |                             | — 4.7Ω - 1MΩ     |        |       | ±15             |

Operating Voltage= $\sqrt{P \cdot R}$  or Max. operating voltage listed above, whichever is lower.Overload Voltage= $2.5 \cdot \sqrt{P \cdot R}$  or Max. overload voltage listed above, whichever is lower.

## High Power Rating Electrical Specifications

| Item<br>Type | Power<br>Rating<br>at 70°C | Operating<br>Temp. Range | Max.<br>Operating<br>Voltage | Max.<br>Overload<br>Voltage | Resistance Range |              |       |            |       | TCR<br>(PPM/°C)          |
|--------------|----------------------------|--------------------------|------------------------------|-----------------------------|------------------|--------------|-------|------------|-------|--------------------------|
|              |                            |                          |                              |                             | ±0.01%           | ±0.05%       | ±0.1% | ±0.25%     | ±0.5% |                          |
| AR03 (0603)  | 1/10W                      | -55 ~ +155°C             | 75V                          | 150V                        | 24.9Ω - 15KΩ     |              |       |            |       | ±5                       |
|              |                            |                          |                              |                             | 24.9Ω - 100KΩ    | 4.7Ω - 332KΩ |       |            |       | ±10<br>±15<br>±25<br>±50 |
|              | 1/6W                       | -55 ~ +155°C             | 100V                         | 150V                        | —                | 100Ω - 332KΩ |       |            |       | ±25<br>±50               |
| AR05 (0805)  | 1/8W                       | -55 ~ +155°C             | 150V                         | 300V                        | 24.9Ω - 30KΩ     |              |       |            |       | ±5                       |
|              |                            |                          |                              |                             | 24.9Ω - 200KΩ    | 4.7Ω -511KΩ  |       |            |       | ±10<br>±15<br>±25<br>±50 |
|              |                            |                          |                              |                             | —                |              |       | 4.7Ω - 1MΩ |       | ±15<br>±25<br>±50        |
|              | 1/4W                       | -55 ~ +155°C             | 150V                         | 300V                        | —                | 100Ω - 500KΩ |       |            |       | ±25<br>±50               |
| AR06 (1206)  | 1/4W                       | -55 ~ +155°C             | 200V                         | 400V                        | 24.9Ω - 50KΩ     |              |       |            |       | ±5                       |
|              |                            |                          |                              |                             | 24.9Ω - 500KΩ    | 4.7Ω - 1MΩ   |       |            |       | ±10<br>±15<br>±25<br>±50 |
|              | 1/3W                       | -55 ~ +155°C             | 200V                         | 400V                        | —                | 100Ω ~1MΩ    |       |            |       | ±25<br>±50               |
| AR13 (1210)  | 1/ 3W                      | -55 ~ +155°C             | 200V                         | 400V                        | 24.9Ω - 50KΩ     |              |       |            |       | ±5                       |
|              |                            |                          |                              |                             | 24.9Ω - 500KΩ    | 4.7Ω - 1MΩ   |       |            |       | ±10<br>±15<br>±25<br>±50 |

Operating Voltage= $\sqrt{P \cdot R}$  or Max. operating voltage listed above, whichever is lower.Overload Voltage= $2.5 \cdot \sqrt{P \cdot R}$  or Max. overload voltage listed above, whichever is lower.

■ Viking is capable of manufacturing the optional spec based on customer's requirement.

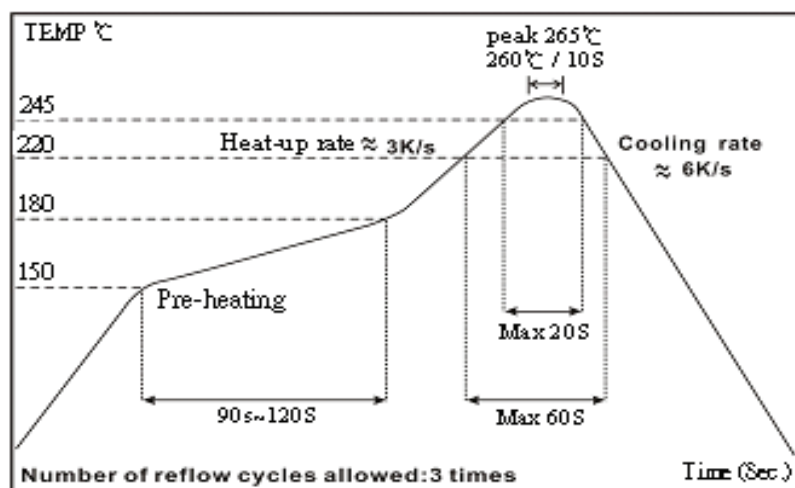
■ Lower Resistance: 1~10Ω ; High Power Rating

## Environmental Characteristics

| Item                                           | Requirement                   |              | Test Method                                                                                                           |
|------------------------------------------------|-------------------------------|--------------|-----------------------------------------------------------------------------------------------------------------------|
|                                                | Tol. ≤ 0.05%                  | Tol. > 0.05% |                                                                                                                       |
| Temperature Coefficient of Resistance (T.C.R.) | As Spec.                      |              | MIL-STD-202F Method 304<br>+25/-55/+25/+125/+25°C                                                                     |
| Short Time Overload                            | ΔR±0.05%                      | ΔR±0.2%      | JIS-C-5201-1 5.5<br>RCWV*2.5 or Max. overload voltage for 5 seconds                                                   |
|                                                | ΔR±0.2% for high power rating |              |                                                                                                                       |
| Insulation Resistance                          | >1000 MΩ                      |              | MIL-STD-202F Method 302<br>Apply 100V <sub>DC</sub> for 1 minute                                                      |
| Endurance                                      | ΔR±0.05%                      | ΔR±0.2%      | MIL-STD-202F Method 108A<br>70±2°C, Max. working voltage for 1000 hrs with 1.5 hrs "ON" and 0.5 hrs "OFF"             |
|                                                | >7kΩ ΔR±0.5%                  |              |                                                                                                                       |
|                                                | ΔR±0.5% for high power rating |              |                                                                                                                       |
| Damp Heat with Load                            | ΔR±0.05%                      | ΔR±0.3%      | MIL-STD-202F Method 103B<br>40±2°C, 90~95% R.H. Max. working voltage for 1000 hrs with 1.5 hrs "ON" and 0.5 hrs "OFF" |
|                                                | ΔR±0.5% for high power rating |              |                                                                                                                       |
| Bending Strength                               | ΔR±0.05%                      | ΔR±0.2%      | JIS-C-5201-1 6.1.4<br>Bending amplitude 3 mm for 10 seconds                                                           |
| Solderability                                  | 95% min. coverage             |              | MIL-STD-202F Method 208H<br>245±5°C for 3 seconds                                                                     |
| Resistance to Soldering Heat                   | ΔR±0.05%                      | ΔR±0.2%      | MIL-STD-202F Method 210E<br>260±5°C for 10 seconds                                                                    |
| Dielectric Withstand Voltage                   | By Type                       |              | MIL-STD-202F Method 301<br>Max. overload voltage for 1 minute                                                         |
| Thermal Shock                                  | ΔR±0.05%                      | ΔR±0.25%     | MIL-STD-202F Method 107G<br>-55°C ~150°C, 100 cycles                                                                  |
| Low Temperature Operation                      | ΔR±0.05%                      | ΔR±0.2%      | JIS-C-5201-1 7.1<br>1 hour, -65°C, followed by 45 minutes of RCWV                                                     |
|                                                | ΔR±0.5% for high power rating |              |                                                                                                                       |

■ Storage Temperature:  $25 \pm 3^\circ\text{C}$ ; Humidity  $< 80\%RH$

## Reflow



## ■ Marking

### 0603 3digit marking



3digit marking for Example: 14C=13K7 $\Omega$  13C=13K3 $\Omega$

68B=4K99 $\Omega$  68X=49.9 $\Omega$

### Marking Table

| Code       | E96             |                 | Code            | E96             |                 | Code            | E96             |                 | Code             | E96              |                  |
|------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|------------------|------------------|------------------|
| 01         | 100             |                 | 25              | 178             |                 | 49              | 316             |                 | 73               | 562              |                  |
| 02         | 102             |                 | 26              | 182             |                 | 50              | 324             |                 | 74               | 576              |                  |
| 03         | 105             |                 | 27              | 187             |                 | 51              | 332             |                 | 75               | 590              |                  |
| 04         | 107             |                 | 28              | 191             |                 | 52              | 340             |                 | 76               | 604              |                  |
| 05         | 110             |                 | 29              | 196             |                 | 53              | 348             |                 | 77               | 619              |                  |
| 06         | 113             |                 | 30              | 200             |                 | 54              | 357             |                 | 78               | 634              |                  |
| 07         | 115             |                 | 31              | 205             |                 | 55              | 365             |                 | 79               | 649              |                  |
| 08         | 118             |                 | 32              | 210             |                 | 56              | 374             |                 | 80               | 665              |                  |
| 09         | 121             |                 | 33              | 215             |                 | 57              | 383             |                 | 81               | 681              |                  |
| 10         | 124             |                 | 34              | 221             |                 | 58              | 392             |                 | 82               | 698              |                  |
| 11         | 127             |                 | 35              | 226             |                 | 59              | 402             |                 | 83               | 715              |                  |
| 12         | 130             |                 | 36              | 232             |                 | 60              | 412             |                 | 84               | 732              |                  |
| 13         | 133             |                 | 37              | 237             |                 | 61              | 422             |                 | 85               | 750              |                  |
| 14         | 137             |                 | 38              | 243             |                 | 62              | 432             |                 | 86               | 768              |                  |
| 15         | 140             |                 | 39              | 249             |                 | 63              | 442             |                 | 87               | 787              |                  |
| 16         | 143             |                 | 40              | 255             |                 | 64              | 453             |                 | 88               | 806              |                  |
| 17         | 147             |                 | 41              | 261             |                 | 65              | 464             |                 | 89               | 825              |                  |
| 18         | 150             |                 | 42              | 267             |                 | 66              | 475             |                 | 90               | 845              |                  |
| 19         | 154             |                 | 43              | 274             |                 | 67              | 487             |                 | 91               | 866              |                  |
| 20         | 158             |                 | 44              | 280             |                 | 68              | 499             |                 | 92               | 887              |                  |
| 21         | 162             |                 | 45              | 287             |                 | 69              | 511             |                 | 93               | 909              |                  |
| 22         | 165             |                 | 46              | 294             |                 | 70              | 523             |                 | 94               | 931              |                  |
| 23         | 169             |                 | 47              | 301             |                 | 71              | 536             |                 | 95               | 953              |                  |
| 24         | 174             |                 | 48              | 309             |                 | 72              | 549             |                 | 96               | 976              |                  |
| Code       | A               | B               | C               | D               | E               | F               | G               | H               | X                | Y                | Z                |
| Multiplier | 10 <sup>0</sup> | 10 <sup>1</sup> | 10 <sup>2</sup> | 10 <sup>3</sup> | 10 <sup>4</sup> | 10 <sup>5</sup> | 10 <sup>6</sup> | 10 <sup>7</sup> | 10 <sup>-1</sup> | 10 <sup>-2</sup> | 10 <sup>-3</sup> |

### 0603 3digit marking for E24

Example: 101=100 $\Omega$  102=1K $\Omega$

|     |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| E24 | 10 | 11 | 12 | 13 | 15 | 16 | 18 | 20 | 22 | 24 | 27 | 30 | 33 | 36 | 39 | 43 | 47 | 51 | 56 | 62 | 68 | 75 | 82 | 91 |
|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|

### 0805~2512 4digit marking

Example

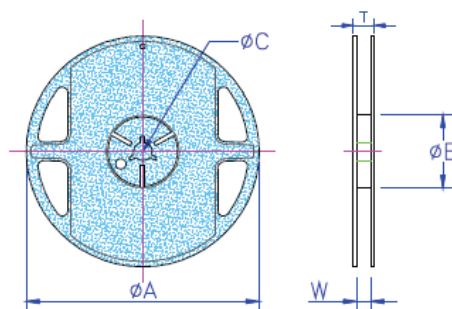
|            |              |               |              |                |               |
|------------|--------------|---------------|--------------|----------------|---------------|
| Resistance | 100 $\Omega$ | 2.2K $\Omega$ | 10K $\Omega$ | 49.9K $\Omega$ | 100K $\Omega$ |
| marking    | 1000         | 2201          | 1002         | 4992           | 1003          |

## ■ Packaging

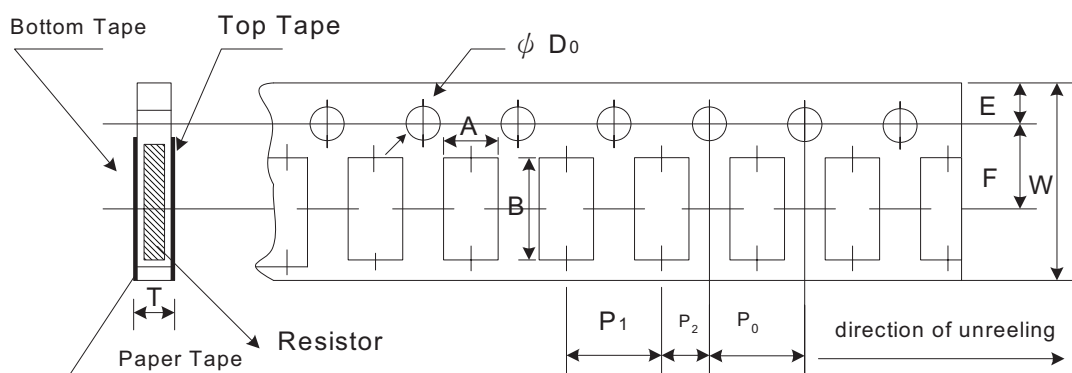
### Packing Quantity & Reel Specifications

Unit : mm

| Type | ØA        | ØB       | ØC       | W        | T        | Paper Tape (EA) | Emboss Plastic Tape (EA) |
|------|-----------|----------|----------|----------|----------|-----------------|--------------------------|
| AR01 | 178.0±1.0 | 60.0±1.0 | 13.5±0.7 | 9.5±1.0  | 11.5±1.0 | 10,000          | -                        |
| AR02 | 178.0±1.0 | 60.0±1.0 | 13.5±0.7 | 9.5±1.0  | 11.5±1.0 | 10,000          | -                        |
| AR03 | 178.0±1.0 | 60.0±1.0 | 13.5±0.7 | 9.5±1.0  | 11.5±1.0 | 5,000           | -                        |
| AR05 | 178.0±1.0 | 60.0±1.0 | 13.5±0.7 | 9.5±1.0  | 11.5±1.0 | 5,000           | -                        |
| AR06 | 178.0±1.0 | 60.0±1.0 | 13.5±0.7 | 9.5±1.0  | 11.5±1.0 | 5,000           | -                        |
| AR13 | 178.0±1.0 | 60.0±1.0 | 13.5±0.7 | 9.5±1.0  | 11.5±1.0 | 5,000           | -                        |
| AR10 | 178.0±1.0 | 60.0±1.0 | 13.5±0.7 | 13.5±1.0 | 15.5±1.0 | -               | 4,000                    |
| AR12 | 178.0±1.0 | 60.0±1.0 | 13.5±0.7 | 13.5±1.0 | 15.5±1.0 | -               | 4,000                    |



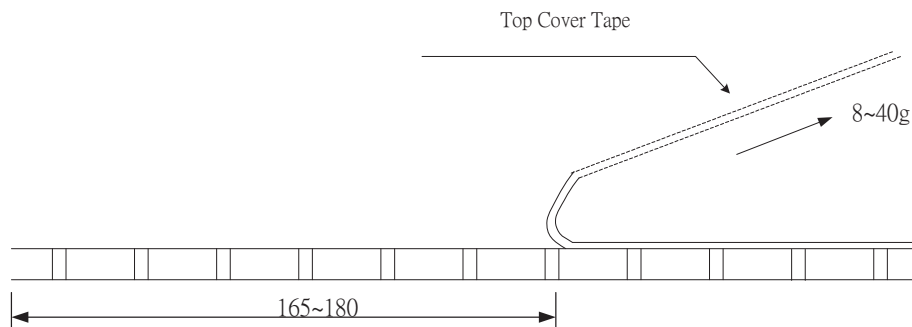
### Paper Tape Specifications



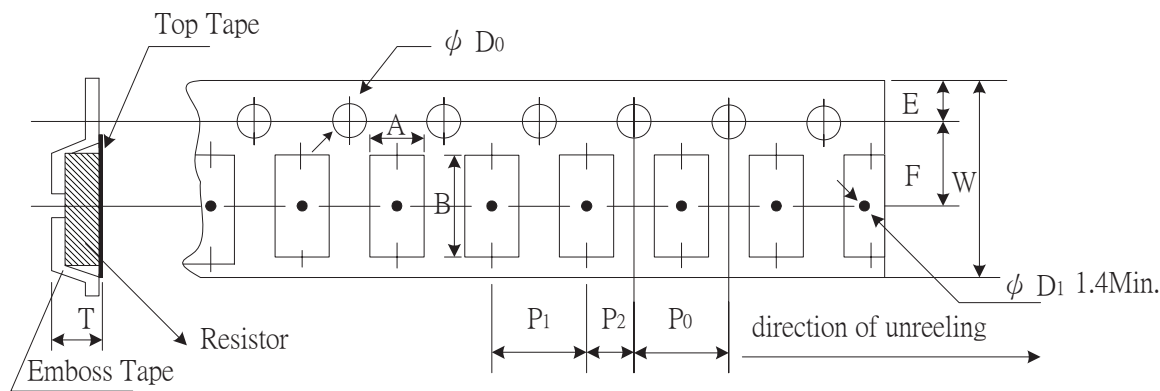
Unit: mm

| Type | A         | B         | W         | E         | F        | P <sub>0</sub> | P <sub>1</sub> | P <sub>2</sub> | ΦD <sub>0</sub> | T         |
|------|-----------|-----------|-----------|-----------|----------|----------------|----------------|----------------|-----------------|-----------|
| AR01 | 0.40±0.05 | 0.70±0.05 | 8.00±0.10 | 1.75±0.05 | 3.5±0.05 | 4.00±0.10      | 2.00±0.05      | 2.00±0.05      | 1.55±0.03       | 0.42±0.02 |
| AR02 | 0.70±0.05 | 1.16±0.05 | 8.00±0.10 | 1.75±0.05 | 3.5±0.05 | 4.00±0.10      | 2.00±0.05      | 2.00±0.05      | 1.55±0.05       | 0.40±0.03 |
| AR03 | 1.10±0.05 | 1.90±0.05 | 8.00±0.10 | 1.75±0.05 | 3.5±0.05 | 4.00±0.10      | 4.00±0.10      | 2.00±0.05      | 1.55±0.05       | 0.60±0.03 |
| AR05 | 1.60±0.05 | 2.37±0.05 | 8.00±0.10 | 1.75±0.05 | 3.5±0.05 | 4.00±0.10      | 4.00±0.10      | 2.00±0.05      | 1.55±0.05       | 0.75±0.05 |
| AR06 | 2.00±0.05 | 3.55±0.05 | 8.00±0.10 | 1.75±0.05 | 3.5±0.05 | 4.00±0.10      | 4.00±0.10      | 2.00±0.05      | 1.55±0.05       | 0.75±0.05 |
| AR13 | 2.75±0.05 | 3.40±0.05 | 8.00±0.10 | 1.75±0.05 | 3.5±0.05 | 4.00±0.05      | 4.00±0.10      | 2.00±0.05      | 1.60±0.10       | 0.75±0.05 |

- Peel force of top cover tape
- The peel speed shall be about 300mm/min±5%
- The peel force of top cover tape shall be between 8g to 40g



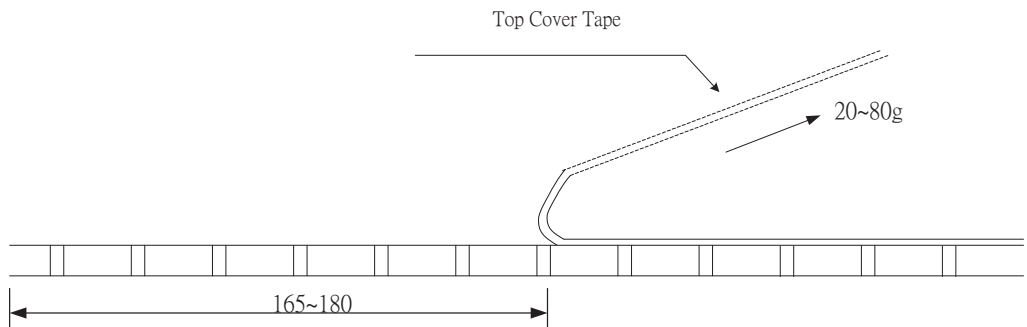
Emboss Plastic Tape Specifications



Unit: mm

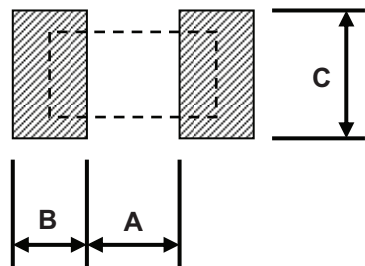
| Type | A         | B         | W         | E         | F        | P <sub>0</sub> | P <sub>1</sub> | P <sub>2</sub> | ØD <sub>0</sub> | T         |
|------|-----------|-----------|-----------|-----------|----------|----------------|----------------|----------------|-----------------|-----------|
| AR10 | 2.85±0.10 | 5.45±0.10 | 12.0±0.10 | 1.75±0.10 | 5.5±0.05 | 4.00±0.05      | 4.00±0.10      | 2.00±0.05      | 1.50±0.10       | 1.00±0.20 |
| AR12 | 3.40±0.10 | 6.65±0.10 | 12.0±0.10 | 1.75±0.10 | 5.5±0.05 | 4.00±0.05      | 4.00±0.10      | 2.00±0.05      | 1.50±0.10       | 1.00±0.20 |

- Peel force of top cover tape
- The peel speed shall be about 300mm/min±5%
- The peel force of top cover tape shall be between 20g to 80g



Recommend Land Pattern

Unit: mm



| Type | A    | B    | C        |
|------|------|------|----------|
| AR01 | 0.25 | 0.30 | 0.40±0.2 |
| AR02 | 0.50 | 0.50 | 0.60±0.2 |
| AR03 | 0.80 | 1.00 | 0.90±0.2 |
| AR05 | 1.00 | 1.00 | 1.35±0.2 |
| AR06 | 2.00 | 1.15 | 1.70±0.2 |
| AR13 | 2.00 | 1.15 | 2.50±0.2 |
| AR10 | 3.60 | 1.40 | 2.50±0.2 |
| AR12 | 4.90 | 1.60 | 3.10±0.2 |