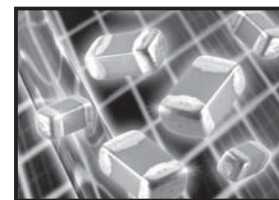


### FEATURES

- LOWER ESR - HIGH Q at HIGH FREQUENCY
- STABLE NPO CHARACTERISTICS OVER TEMPERATURE AND VOLTAGE
- EIA 0201, 0402, 0603 & 0805 CASE SIZES
- WIDE CAPACITANCE (UP TO 3,300pF) & VOLTAGE RANGE (UP TO 100VDC)



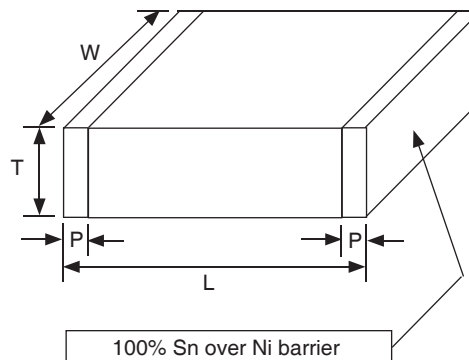
### RoHS Compliant

Includes all homogeneous materials

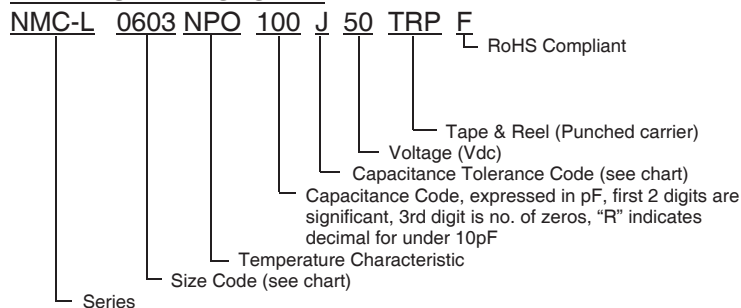
\*See Part Number System for Details

| SPECIFICATIONS                  | NPO                                                                                                                                           |               |                              |               |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|---------------|------------------------------|---------------|
| Case Sizes                      | 0201                                                                                                                                          | 0402          | 0603                         | 0805          |
| Capacitance Range*              | 1.0pF ~ 15pF                                                                                                                                  | 0.5pF ~ 470pF | 0.5pF ~ 3300pF               | 1.0pF ~ 150pF |
| Capacitance Tolerance           | Cap. Values ≤ 5pF: ±0.1pF(B), ±0.25pF(C)<br>Cap. Values 5pF ~ 8.2pF: ±0.25pF(C), ±0.5pF(D)<br>Cap. Values ≥10pF: ±1%(F), ±2%(G), ±5% (J)      |               |                              |               |
| Operating Temperature Range     | -55°C ~ +125°C                                                                                                                                |               |                              |               |
| Temperature Characteristics     | 0 ± 30PPM/°C                                                                                                                                  |               |                              |               |
| Rated Voltage                   | 16Vdc, 25Vdc, 50Vdc                                                                                                                           |               | 16Vdc, 25Vdc, 50Vdc & 100Vdc |               |
| Q Factor*                       | Cap. Values <30pF: Q ≥ 400 + 20C<br>Cap. Values ≥30pF: Q ≥ 1000                                                                               |               |                              |               |
| ESR                             | Cap. Values < 2.2pF: ≤1000mΩ@900MHz ± 100MHz<br>Cap. Values 2.2pF ~ 470pF: ≤500mΩ@900MHz ± 100MHz<br>Cap. Values >470pF: ≤500mΩ@60MHz ± 10MHz |               |                              |               |
| Insulation Resistance           | 10,000 Megohms min. @ +25°C                                                                                                                   |               |                              |               |
| Dielectric Withstanding Voltage | 250% of rated voltage for 1 ~ 5 seconds                                                                                                       |               |                              |               |
| Test Conditions (Cap. & Q)      | *1.0 ± 0.2Vrms, 1MHz ± 10% (<1000pF) or 1KHz ± 10% (>1000pF)                                                                                  |               |                              |               |

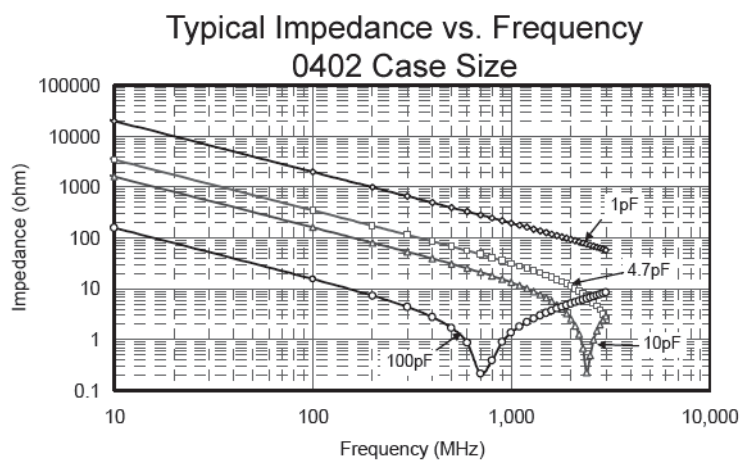
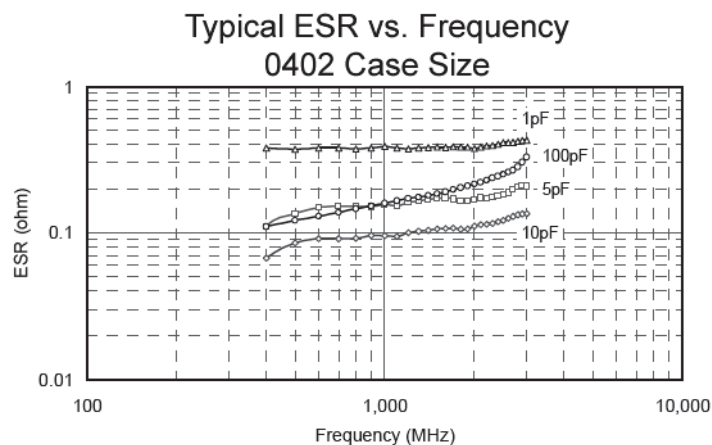
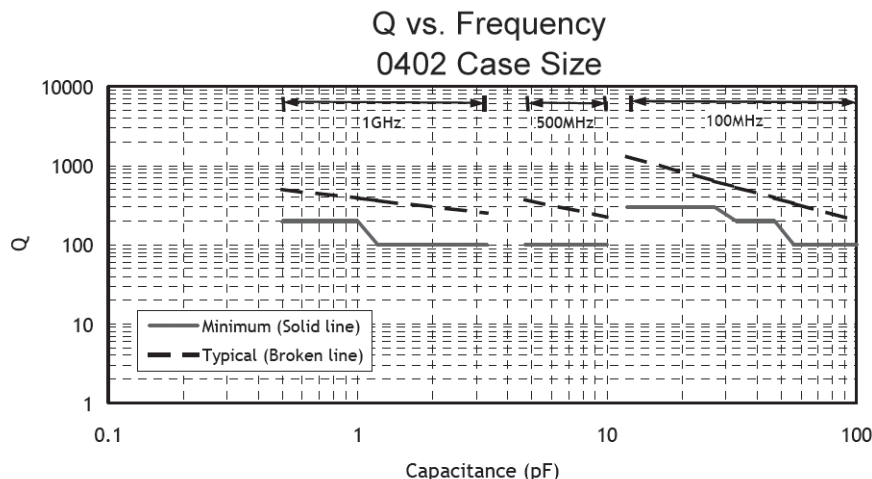
| EIA Case Size         | 0201             | 0402             | 0603             | 0805             |
|-----------------------|------------------|------------------|------------------|------------------|
| Length (L)            | $0.6 \pm 0.05$   | $1.0 \pm 0.05$   | $1.6 \pm 0.10$   | $2.0 \pm 0.10$   |
| Width (W)             | $0.3 \pm 0.05$   | $0.5 \pm 0.05$   | $0.8 \pm 0.10$   | $1.25 \pm 0.10$  |
| Thickness (T)         | 0.33 max.        | 0.60 max.        | 1.0 max.         | 1.3 max.         |
| Termination Width (P) | $0.10 \sim 0.20$ | $0.15 \sim 0.30$ | $0.12 \sim 0.55$ | $0.25 \sim 0.71$ |

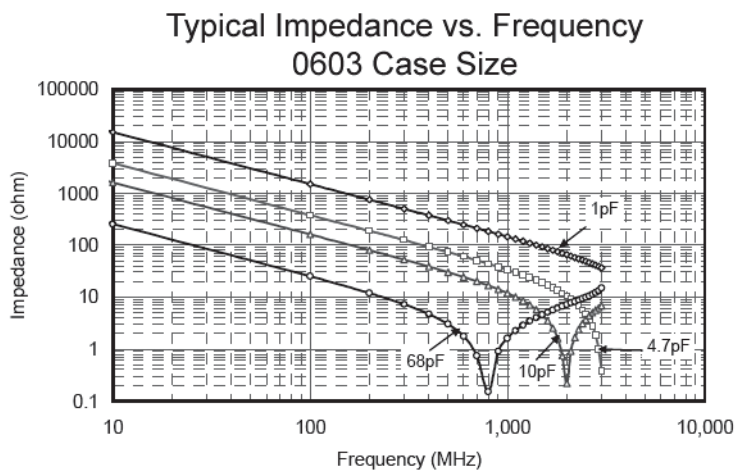
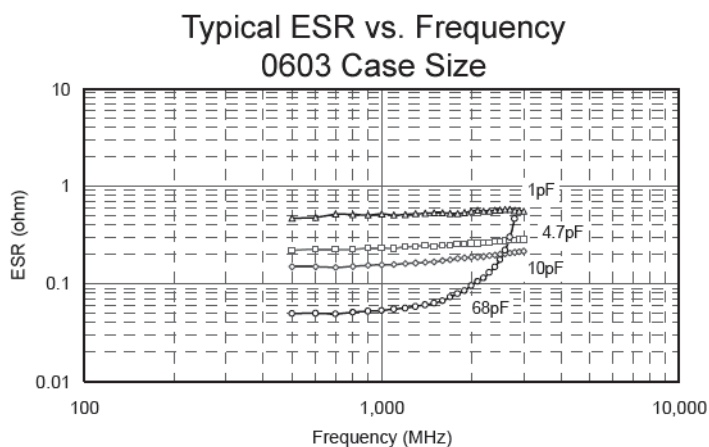
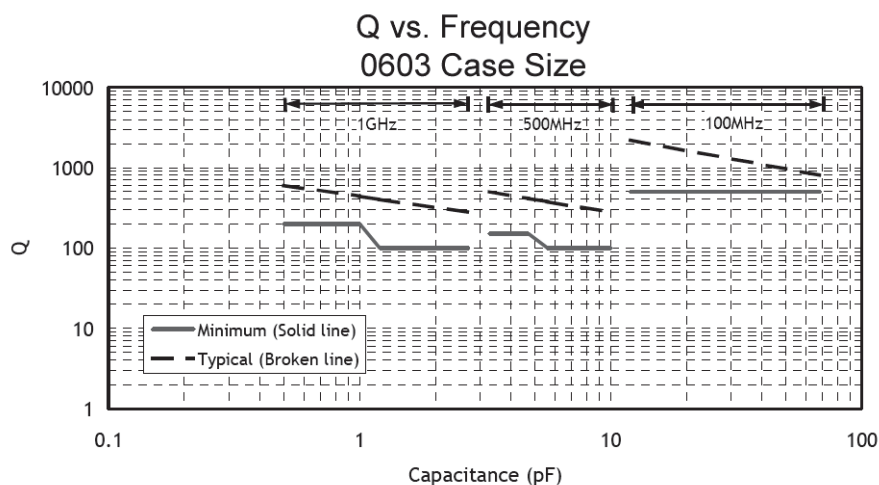


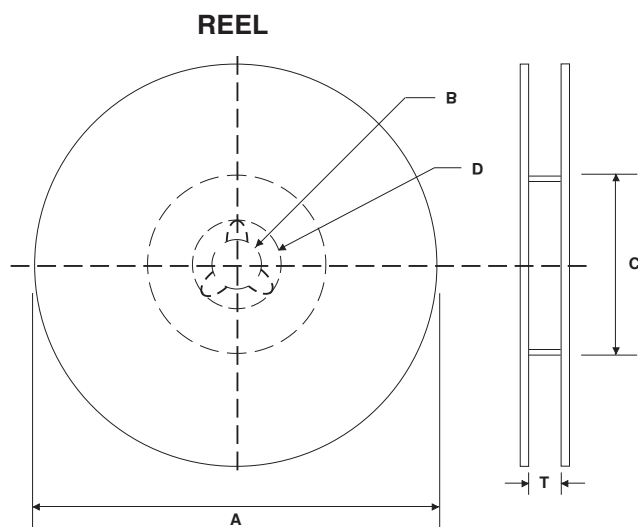
### PART NUMBER SYSTEM



| EIA Case Size         | 0201                         | 0402                          |                                |    |     | 0603                         |                                |    |     | 0805                           |     |  |
|-----------------------|------------------------------|-------------------------------|--------------------------------|----|-----|------------------------------|--------------------------------|----|-----|--------------------------------|-----|--|
| 2.0                   | 0.6 ± 0.05                   | 1.0 ± 0.05                    |                                |    |     | 1.6 ±0.10                    |                                |    |     | 2.0 ± 0.1                      |     |  |
| Width (W)             | 0.3 ± 0.05                   | 0.5 ± 0.05                    |                                |    |     | 0.8 ± 0.10                   |                                |    |     | 1.25 ± 0.1                     |     |  |
| Thickness max. (T)    | 0.33 max                     | 0.55 max.                     |                                |    |     | 0.87 max.                    |                                |    |     | 1.30 max.                      |     |  |
| Termination Width (P) | 0.10 ~ 0.20                  | 0.15 ~ 0.30                   |                                |    |     | 0.25 ~ 0.55                  |                                |    |     | 0.25 ~ 0.71                    |     |  |
| Capacitance (pF)      | Working Voltage (Vdc)        |                               |                                |    |     |                              |                                |    |     |                                |     |  |
|                       | 25V                          | 16                            | 25                             | 50 | 100 | 16                           | 25                             | 50 | 100 | 50                             | 100 |  |
| 0.5                   |                              |                               | 0.700Ω<br>max. ESR<br>@ 500MHz |    |     |                              | 0.700Ω<br>max. ESR<br>@ 500MHz |    |     | 0.700Ω<br>max. ESR<br>@ 500MHz |     |  |
| 0.6                   |                              |                               |                                |    |     |                              |                                |    |     |                                |     |  |
| 0.7                   |                              |                               |                                |    |     |                              |                                |    |     |                                |     |  |
| 0.8                   |                              |                               |                                |    |     |                              |                                |    |     |                                |     |  |
| 0.9                   |                              |                               |                                |    |     |                              |                                |    |     |                                |     |  |
| 1.0                   |                              |                               |                                |    |     |                              |                                |    |     |                                |     |  |
| 1.2                   | 0.700Ω<br>max. ESR<br>@ 1GHz |                               |                                |    |     |                              |                                |    |     |                                |     |  |
| 1.5                   |                              |                               |                                |    |     |                              |                                |    |     |                                |     |  |
| 1.8                   |                              |                               |                                |    |     |                              |                                |    |     |                                |     |  |
| 2.2                   |                              |                               |                                |    |     |                              |                                |    |     |                                |     |  |
| 2.7                   |                              |                               |                                |    |     |                              |                                |    |     |                                |     |  |
| 3.3                   |                              |                               | 0.385Ω<br>max. ESR<br>@ 500MHz |    |     |                              | 0.385Ω<br>max. ESR<br>@ 500MHz |    |     | 0.385Ω<br>max. ESR<br>@ 500MHz |     |  |
| 3.9                   |                              |                               |                                |    |     |                              |                                |    |     |                                |     |  |
| 4.7                   |                              |                               |                                |    |     |                              |                                |    |     |                                |     |  |
| 5.6                   |                              |                               |                                |    |     |                              |                                |    |     |                                |     |  |
| 6.8                   | 0.385Ω<br>max. ESR<br>@ 1GHz |                               |                                |    |     |                              |                                |    |     |                                |     |  |
| 8.2                   |                              |                               |                                |    |     |                              |                                |    |     |                                |     |  |
| 10                    |                              |                               |                                |    |     |                              |                                |    |     |                                |     |  |
| 12                    |                              |                               |                                |    |     |                              |                                |    |     |                                |     |  |
| 15                    |                              |                               |                                |    |     |                              |                                |    |     |                                |     |  |
| 18                    |                              |                               | 0.300Ω<br>max. ESR<br>@ 500MHz |    |     |                              | 0.300Ω<br>max. ESR<br>@ 500MHz |    |     | 0.300Ω<br>max. ESR<br>@ 500MHz |     |  |
| 22                    |                              |                               |                                |    |     |                              |                                |    |     |                                |     |  |
| 27                    |                              |                               |                                |    |     |                              |                                |    |     |                                |     |  |
| 33                    |                              |                               |                                |    |     |                              |                                |    |     |                                |     |  |
| 39                    |                              |                               |                                |    |     |                              |                                |    |     |                                |     |  |
| 47                    |                              |                               |                                |    |     |                              |                                |    |     |                                |     |  |
| 56                    |                              |                               |                                |    |     |                              |                                |    |     |                                |     |  |
| 68                    |                              |                               |                                |    |     |                              |                                |    |     |                                |     |  |
| 82                    |                              |                               | 0.260Ω<br>max. ESR<br>@ 500MHz |    |     |                              | 0.260Ω<br>max. ESR<br>@ 500MHz |    |     | 0.260Ω<br>max. ESR<br>@ 500MHz |     |  |
| 100                   |                              |                               |                                |    |     |                              |                                |    |     |                                |     |  |
| 110                   |                              |                               | 0.500Ω<br>max. ESR<br>@ 500MHz |    |     |                              | 0.400Ω<br>max. ESR<br>@ 500MHz |    |     | 0.260Ω<br>max. ESR<br>@ 500MHz |     |  |
| 120                   |                              |                               |                                |    |     |                              |                                |    |     |                                |     |  |
| 130                   |                              |                               |                                |    |     |                              |                                |    |     |                                |     |  |
| 150                   |                              |                               |                                |    |     |                              |                                |    |     |                                |     |  |
| 180                   |                              |                               | 500mΩ<br>max. ESR<br>@ 900MHz  |    |     |                              | 500mΩ<br>max. ESR<br>@ 900MHz  |    |     |                                |     |  |
| 220                   |                              |                               |                                |    |     |                              |                                |    |     |                                |     |  |
| 270                   |                              | 500mΩ<br>max. ESR<br>@ 900MHz |                                |    |     |                              | 500mΩ<br>max. ESR<br>@ 900MHz  |    |     |                                |     |  |
| 330                   |                              |                               |                                |    |     |                              |                                |    |     |                                |     |  |
| 390                   |                              |                               |                                |    |     |                              |                                |    |     |                                |     |  |
| 470                   |                              |                               |                                |    |     |                              |                                |    |     |                                |     |  |
| 560                   |                              |                               |                                |    |     |                              | 500mΩ<br>max. ESR<br>@ 60MHz   |    |     |                                |     |  |
| 680                   |                              |                               |                                |    |     |                              |                                |    |     |                                |     |  |
| 820                   |                              |                               |                                |    |     |                              |                                |    |     |                                |     |  |
| 1,000                 |                              |                               |                                |    |     |                              |                                |    |     |                                |     |  |
| 1,200                 |                              |                               |                                |    |     | 500mΩ<br>max. ESR<br>@ 60MHz |                                |    |     |                                |     |  |
| 1,500                 |                              |                               |                                |    |     |                              |                                |    |     |                                |     |  |
| 1,800                 |                              |                               |                                |    |     |                              |                                |    |     |                                |     |  |
| 2,200                 |                              |                               |                                |    |     |                              |                                |    |     |                                |     |  |
| 2,700                 |                              |                               |                                |    |     |                              |                                |    |     |                                |     |  |
| 3,300                 |                              |                               |                                |    |     |                              |                                |    |     |                                |     |  |







## REEL DIMENSIONS (mm)

| Reel Diameter (A) | B        | C         | D        | T max.                                          |
|-------------------|----------|-----------|----------|-------------------------------------------------|
| 7" (178 ± 2.0)    | 13 ± 0.5 | 50 min.   | 21 ± 1.0 | 8.4 +1.0/-0<br>(1812 case size<br>12.4 +2.0/-0) |
| 10" (250 ± 2.0)   |          | 100 ± 1.0 |          |                                                 |
| 13" (330 ± 2.0)   |          | 100 ± 1.0 |          |                                                 |

## 7 INCH REEL QUANTITIES\*

| Size              | 01005  | 0201   | 0402   | 0603  | 0805  | 1206  | 1210  | 1812  |
|-------------------|--------|--------|--------|-------|-------|-------|-------|-------|
| Tape Size         | 8mm    | 8mm    | 8mm    | 8mm   | 8mm   | 8mm   | 8mm   | 12mm  |
| Min. Qty Per Reel | 20,000 | 20,000 | 10,000 | 4,000 | 4,000 | 4,000 | 2,000 | 1,000 |
| Max. Qty Per Reel | 20,000 | 20,000 | 10,000 | 4,000 | 5,000 | 5,000 | 5,000 | 2,000 |

\*Quantity dependent on chip thickness. Contact NIC for reel quantities on larger diameter reels.

## CARRIER TAPE MATERIAL

Parts with a thickness of  $\geq 1$ mm will be taped on embossed plastic carrier. Parts with a thickness of less than 1mm will be taped on paper carrier

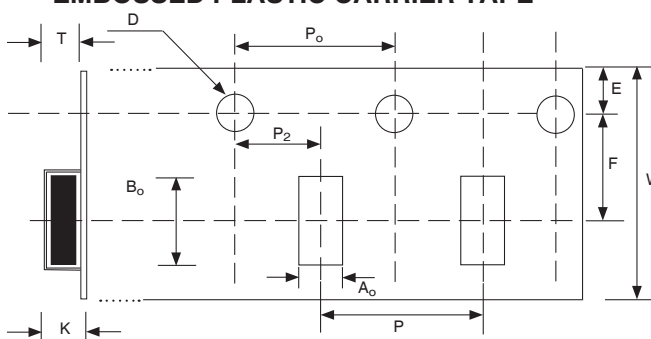
## EMBOSSED PLASTIC CARRIER TAPE DIMENSIONS (mm)

| Tape Size | W         | F          | E           | P <sub>0</sub> | P <sub>2</sub> | D                                   | K max. | T max. | P         |
|-----------|-----------|------------|-------------|----------------|----------------|-------------------------------------|--------|--------|-----------|
| 8mm       | 8.0 ± 0.2 | 3.5 ± 0.05 | 1.75 ± 0.10 | 4.0 ± 0.1      | 2.0 ± 0.5      | 1.5 <sup>+0.1</sup> <sub>-0.0</sub> | 3.0    | 2.0    | 4.0 ± 0.1 |
| 12mm      | 12 ± 0.2  | 5.5 ± 0.05 |             |                |                |                                     |        | 4.5    | 8.0 ± 0.1 |

### Notes:

- Specifications are in compliance with EIA RS481-1-A "Taping of surface Mount Components for Automatic Placement"
- Dimensions A<sub>0</sub> (max.) equals component width dimension plus 0.5mm
- Dimension B<sub>0</sub> (max.) equals component length dimension plus 0.5mm

## EMBOSSED PLASTIC CARRIER TAPE



See notes 2 & 3 regarding dimensions A<sub>0</sub> and B<sub>0</sub>

## PUNCHED CARRIER TAPE DIMENSIONS (mm)

| Type  | A <sub>o</sub> | B <sub>o</sub> | W         | F          | E          | P1         | P0        | D0               | T1<br>max. | T2<br>max. | Mounting<br>Hole         |  |  |  |
|-------|----------------|----------------|-----------|------------|------------|------------|-----------|------------------|------------|------------|--------------------------|--|--|--|
| 01005 | 0.25 ± 0.04    | 0.45 ± 0.04    | 8.0 ± 0.3 | 3.5 ± 0.05 | 1.75 ± 0.1 | 2.0 ± 0.05 | 4.0 ± 0.1 | 1.5<br>+0.1/-0.0 | 0.27       | 0.36       | Angular<br>Punch<br>Hole |  |  |  |
| 0201  | 0.37 ± 0.03    | 0.67 ± 0.05    |           |            |            |            |           |                  | 0.45       | 0.80       |                          |  |  |  |
| 0402  | 0.65 ± 0.05    | 1.15 ± 0.05    |           |            |            | 4.0 ± 0.10 |           |                  | 1.1        | 1.4        |                          |  |  |  |
| 0603  | 1.1 ± 0.2      | 1.9 ± 0.2      |           |            |            |            |           |                  |            |            |                          |  |  |  |
| 0805  | 1.65 ± 0.2     | 2.4 ± 0.2      |           |            |            |            |           |                  |            |            |                          |  |  |  |
| 1206  | 2.0 ± 0.2      | 3.6 ± 0.2      |           |            |            |            |           |                  |            |            |                          |  |  |  |

## PUNCHED CARRIER TAPE

