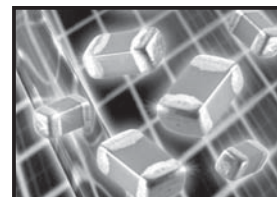


### FEATURES

- LOWER ESR - HIGH Q at HIGH FREQUENCY
- STABLE NPO CHARACTERISTICS OVER TEMPERATURE AND VOLTAGE
- EIA 0201, 0402 AND 0603 CASE SIZES
- IDEAL FOR WIRELESS DATA AND VOICE COMMUNICATIONS APPLICATIONS  
WLANs, HIPERLAN, 802.11A, 802.11B, Wi-Fi, BLUETOOTH, TELEMATICS, PCS, LMDS AND CELLULAR



| SPECIFICATIONS                  | NPO                                                         |
|---------------------------------|-------------------------------------------------------------|
| Capacitance Range               | 0.1pF ~ 22pF                                                |
| Capacitance Tolerance           | ±0.1pF(B), ±0.25pF(C), ±0.5pF(D)<br>±1%(F), ±2%(G), ±5% (J) |
| Operating Temperature Range     | -55°C ~ +125°C                                              |
| Temperature Characteristics     | 0 ± 30PPM/°C                                                |
| Rated Voltage                   | 25Vdc, 50Vdc                                                |
| Dissipation Factor              | 0.001 max. (1MHz, +25°C)                                    |
| Insulation Resistance           | 10,000 Megohms min. @ +25°C                                 |
| Dielectric Withstanding Voltage | 125Vdc for 5 ± 1 seconds                                    |

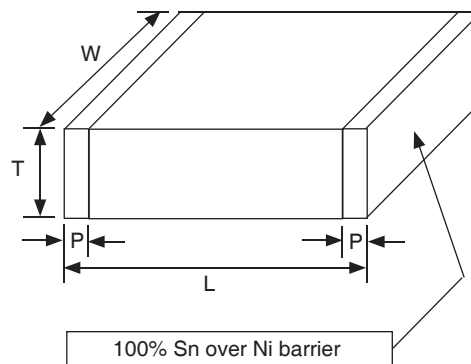
### RoHS Compliant

Includes all homogeneous materials

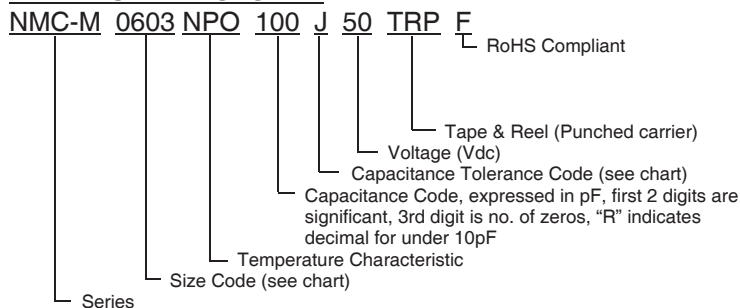
\*See Part Number System for Details

### DIMENSIONS (mm)

| EIA Case Size         | 0201        | 0402        | 0603        |
|-----------------------|-------------|-------------|-------------|
| Length (L)            | 0.6 ± 0.03  | 1.0 ± 0.05  | 1.6 ± 0.15  |
| Width (W)             | 0.3 ± 0.03  | 0.5 ± 0.05  | 0.8 ± 0.15  |
| Thickness (T)         | 0.33 max.   | 0.6 max.    | 1.0 max.    |
| Termination Width (P) | 0.10 ~ 0.20 | 0.10 ~ 0.30 | 0.25 ~ 0.60 |



### PART NUMBER SYSTEM



### 0201 25 VOLT STANDARD VALUES AND CHARACTERISTICS

| NIC PART NUMBER        | CAPACITANCE<br>VALUE (pF) | AVAILABLE<br>TOLERANCE | Q FACTOR<br>(MIN. @ 1GHz) | ESR $\Omega$<br>(@ 1GHz)* |
|------------------------|---------------------------|------------------------|---------------------------|---------------------------|
| NMC-M0201NPO0R1_25TRPF | 0.1                       | B, C                   | 350                       | 0.900                     |
| NMC-M0201NPO0R2_25TRPF | 0.2                       | B, C                   | 350                       | 0.900                     |
| NMC-M0201NPO0R3_25TRPF | 0.3                       | B, C                   | 350                       | 0.900                     |
| NMC-M0201NPO0R4_25TRPF | 0.4                       | B, C                   | 350                       | 0.900                     |
| NMC-M0201NPO0R5_25TRPF | 0.5                       | B, C                   | 350                       | 0.800                     |
| NMC-M0201NPO0R6_25TRPF | 0.6                       | B, C                   | 350                       | 0.700                     |
| NMC-M0201NPO0R7_25TRPF | 0.7                       | B, C                   | 350                       | 0.600                     |
| NMC-M0201NPO0R8_25TRPF | 0.8                       | B, C                   | 350                       | 0.500                     |
| NMC-M0201NPO0R9_25TRPF | 0.9                       | B, C                   | 350                       | 0.500                     |
| NMC-M0201NPO1R0_25TRPF | 1.0                       | B, C                   | 350                       | 0.400                     |
| NMC-M0201NPO1R1_25TRPF | 1.1                       | B, C                   | 300                       | 0.400                     |
| NMC-M0201NPO1R2_25TRPF | 1.2                       | B, C                   | 300                       | 0.350                     |
| NMC-M0201NPO1R3_25TRPF | 1.3                       | B, C                   | 300                       | 0.300                     |
| NMC-M0201NPO1R5_25TRPF | 1.5                       | B, C                   | 300                       | 0.300                     |
| NMC-M0201NPO1R6_25TRPF | 1.6                       | B, C                   | 300                       | 0.300                     |
| NMC-M0201NPO1R8_25TRPF | 1.8                       | B, C                   | 300                       | 0.300                     |
| NMC-M0201NPO2R0_25TRPF | 2.0                       | B, C                   | 250                       | 0.300                     |
| NMC-M0201NPO2R2_25TRPF | 2.2                       | B, C                   | 250                       | 0.250                     |
| NMC-M0201NPO2R4_25TRPF | 2.4                       | B, C                   | 250                       | 0.250                     |
| NMC-M0201NPO2R7_25TRPF | 2.7                       | B, C                   | 250                       | 0.250                     |
| NMC-M0201NPO3R0_25TRPF | 3.0                       | B, C                   | 200                       | 0.250                     |
| NMC-M0201NPO3R3_25TRPF | 3.3                       | B, C                   | 200                       | 0.250                     |
| NMC-M0201NPO3R9_25TRPF | 3.9                       | B, C                   | 200                       | 0.200                     |
| NMC-M0201NPO4R7_25TRPF | 4.7                       | B, C                   | 200                       | 0.150                     |
| NMC-M0201NPO5R6_25TRPF | 5.6                       | B, C, D                | 120                       | 0.150                     |
| NMC-M0201NPO6R8_25TRPF | 6.8                       | B, C, D                | 120                       | 0.150                     |
| NMC-M0201NPO8R2_25TRPF | 8.2                       | B, C, D                | 120                       | 0.150                     |
| NMC-M0201NPO100_25TRPF | 10                        | F, G, J                | 120                       | 0.150                     |

\*Typical ESR

### 0402 25 VOLT STANDARD VALUES AND CHARACTERISTICS

| NIC PART NUMBER        | CAPACITANCE<br>VALUE (pF) | AVAILABLE<br>TOLERANCE | Q FACTOR<br>(MIN. @ 1GHz) | ESR $\Omega$<br>(@ 1GHz)* |
|------------------------|---------------------------|------------------------|---------------------------|---------------------------|
| NMC-M0402NPO0R1B25TRPF | 0.1                       | B                      | 500                       | 3.183                     |
| NMC-M0402NPO0R2B25TRPF | 0.2                       | B                      | 500                       | 1.592                     |
| NMC-M0402NPO0R3B25TRPF | 0.3                       | B                      | 500                       | 1.061                     |
| NMC-M0402NPO0R4B25TRPF | 0.4                       | B                      | 500                       | 0.796                     |
| NMC-M0402NPO0R5B25TRPF | 0.5                       | B                      | 500                       | 0.637                     |
| NMC-M0402NPO0R6B25TRPF | 0.6                       | B                      | 500                       | 0.531                     |
| NMC-M0402NPO0R7B25TRPF | 0.7                       | B                      | 500                       | 0.455                     |
| NMC-M0402NPO0R8B25TRPF | 0.8                       | B                      | 500                       | 0.398                     |
| NMC-M0402NPO0R9B25TRPF | 0.9                       | B                      | 500                       | 0.354                     |
| NMC-M0402NPO1R0B25TRPF | 1.0                       | B                      | 350                       | 0.455                     |
| NMC-M0402NPO1R1B25TRPF | 1.1                       | B                      | 350                       | 0.413                     |
| NMC-M0402NPO1R2B25TRPF | 1.2                       | B                      | 350                       | 0.379                     |
| NMC-M0402NPO1R3B25TRPF | 1.3                       | B                      | 350                       | 0.350                     |
| NMC-M0402NPO1R5B25TRPF | 1.5                       | B                      | 350                       | 0.303                     |
| NMC-M0402NPO1R6B25TRPF | 1.6                       | B                      | 350                       | 0.284                     |
| NMC-M0402NPO1R8B25TRPF | 1.8                       | B                      | 350                       | 0.253                     |
| NMC-M0402NPO2R0B25TRPF | 2.0                       | B                      | 250                       | 0.318                     |
| NMC-M0402NPO2R2B25TRPF | 2.2                       | B                      | 250                       | 0.289                     |
| NMC-M0402NPO2R4B25TRPF | 2.4                       | B                      | 250                       | 0.265                     |
| NMC-M0402NPO2R7B25TRPF | 2.7                       | B                      | 250                       | 0.236                     |
| NMC-M0402NPO3R0B25TRPF | 3.0                       | B                      | 250                       | 0.212                     |
| NMC-M0402NPO3R3C25TRPF | 3.3                       | C                      | 200                       | 0.241                     |
| NMC-M0402NPO3R9C25TRPF | 3.9                       | C                      | 180                       | 0.227                     |
| NMC-M0402NPO4R7C25TRPF | 4.7                       | C                      | 150                       | 0.226                     |
| NMC-M0402NPO5R6C25TRPF | 5.6                       | C                      | 120                       | 0.237                     |
| NMC-M0402NPO6R8C25TRPF | 6.8                       | C                      | 100                       | 0.234                     |
| NMC-M0402NPO8R2C25TRPF | 8.2                       | C                      | 80                        | 0.243                     |
| NMC-M0402NPO100C25TRPF | 10                        | C                      | 80                        | 0.199                     |
| NMC-M0402NPO120J25TRPF | 12                        | J                      | 60                        | 0.211                     |
| NMC-M0402NPO150J25TRPF | 15                        | J                      | 40                        | 0.265                     |

\*Typical ESR



### 0402 50 VOLT STANDARD VALUES AND CHARACTERISTICS

| NIC PART NUMBER        | CAPACITANCE<br>VALUE (pF) | AVAILABLE<br>TOLERANCE | Q FACTOR<br>(MIN. @ 1GHz) | ESR $\Omega$<br>(@ 1GHz)* |
|------------------------|---------------------------|------------------------|---------------------------|---------------------------|
| NMC-M0402NPO0R1B50TRPF | 0.1                       | B                      | 300                       | 2.112                     |
| NMC-M0402NPO0R2B50TRPF | 0.2                       | B                      | 300                       | 1.324                     |
| NMC-M0402NPO0R3B50TRPF | 0.3                       | B                      | 300                       | 0.911                     |
| NMC-M0402NPO0R4B50TRPF | 0.4                       | B                      | 300                       | 0.884                     |
| NMC-M0402NPO0R5B50TRPF | 0.5                       | B                      | 300                       | 0.851                     |
| NMC-M0402NPO0R6B50TRPF | 0.6                       | B                      | 300                       | 0.751                     |
| NMC-M0402NPO0R7B50TRPF | 0.7                       | B                      | 300                       | 0.723                     |
| NMC-M0402NPO0R8B50TRPF | 0.8                       | B                      | 300                       | 0.679                     |
| NMC-M0402NPO0R9B50TRPF | 0.9                       | B                      | 300                       | 0.659                     |
| NMC-M0402NPO1R0B50TRPF | 1.0                       | B                      | 300                       | 0.652                     |
| NMC-M0402NPO1R1B50TRPF | 1.1                       | B                      | 300                       | 0.584                     |
| NMC-M0402NPO1R2B50TRPF | 1.2                       | B                      | 250                       | 0.481                     |
| NMC-M0402NPO1R3B50TRPF | 1.3                       | B                      | 250                       | 0.453                     |
| NMC-M0402NPO1R5B50TRPF | 1.5                       | B                      | 350                       | 0.422                     |
| NMC-M0402NPO1R6B50TRPF | 1.6                       | B                      | 250                       | 0.422                     |
| NMC-M0402NPO1R8B50TRPF | 1.8                       | B                      | 250                       | 0.399                     |
| NMC-M0402NPO2R0B50TRPF | 2.0                       | B                      | 200                       | 0.356                     |
| NMC-M0402NPO2R2B50TRPF | 2.2                       | B                      | 200                       | 0.354                     |
| NMC-M0402NPO2R4B50TRPF | 2.4                       | B                      | 200                       | 0.321                     |
| NMC-M0402NPO2R7B50TRPF | 2.7                       | B                      | 200                       | 0.322                     |
| NMC-M0402NPO3R0B50TRPF | 3.0                       | B                      | 200                       | 0.321                     |
| NMC-M0402NPO3R3C50TRPF | 3.3                       | C                      | 200                       | 0.288                     |
| NMC-M0402NPO3R9C50TRPF | 3.9                       | C                      | 180                       | 0.244                     |
| NMC-M0402NPO4R7C50TRPF | 4.7                       | C                      | 150                       | 0.218                     |
| NMC-M0402NPO5R6C50TRPF | 5.6                       | C                      | 150                       | 0.201                     |
| NMC-M0402NPO6R8C50TRPF | 6.8                       | C                      | 150                       | 0.201                     |
| NMC-M0402NPO8R2C50TRPF | 8.2                       | C                      | 100                       | 0.203                     |
| NMC-M0402NPO100C50TRPF | 10                        | C                      | 100                       | 0.202                     |
| NMC-M0402NPO120J50TRPF | 12                        | J                      | 60                        | 0.165                     |
| NMC-M0402NPO150J50TRPF | 15                        | J                      | 40                        | 0.149                     |
| NMC-M0402NPO180J50TRPF | 18                        | J                      | 40                        | 0.138                     |
| NMC-M0402NPO220J50TRPF | 22                        | J                      | 40                        | 0.121                     |

\*Typical ESR

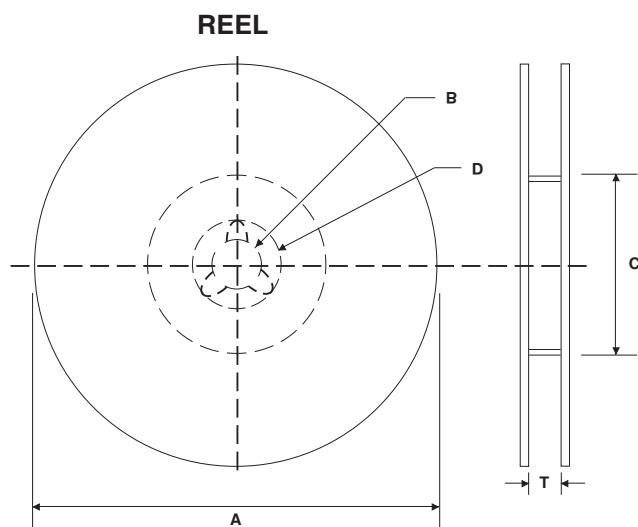


### 0603 50 VOLT STANDARD VALUES AND CHARACTERISTICS

| NIC PART NUMBER        | CAPACITANCE<br>VALUE (pF) | AVAILABLE<br>TOLERANCE | Q FACTOR<br>(MIN. @ 1GHz) | ESR $\Omega$<br>(@ 1GHz)* |
|------------------------|---------------------------|------------------------|---------------------------|---------------------------|
| NMC-M0603NPO0R4B50TRPF | 0.4                       | B                      | 300                       | 1.326                     |
| NMC-M0603NPO0R5B50TRPF | 0.5                       | B                      | 300                       | 1.061                     |
| NMC-M0603NPO0R6B50TRPF | 0.6                       | B                      | 300                       | 0.884                     |
| NMC-M0603NPO0R7B50TRPF | 0.7                       | B                      | 300                       | 0.757                     |
| NMC-M0603NPO0R8B50TRPF | 0.8                       | B                      | 300                       | 0.663                     |
| NMC-M0603NPO0R9B50TRPF | 0.9                       | B                      | 300                       | 0.589                     |
| NMC-M0603NPO1R0B50TRPF | 1.0                       | B                      | 300                       | 0.530                     |
| NMC-M0603NPO1R1B50TRPF | 1.1                       | B                      | 300                       | 0.482                     |
| NMC-M0603NPO1R2B50TRPF | 1.2                       | B                      | 250                       | 0.530                     |
| NMC-M0603NPO1R5B50TRPF | 1.5                       | B                      | 250                       | 0.424                     |
| NMC-M0603NPO1R8B50TRPF | 1.8                       | B                      | 200                       | 0.442                     |
| NMC-M0603NPO2R0B50TRPF | 2.0                       | B                      | 200                       | 0.397                     |
| NMC-M0603NPO2R2_50TRPF | 2.2                       | B, C                   | 100                       | 0.723                     |
| NMC-M0603NPO2R4_50TRPF | 2.4                       | B, C                   | 100                       | 0.663                     |
| NMC-M0603NPO2R7_50TRPF | 2.7                       | B, C                   | 100                       | 0.589                     |
| NMC-M0603NPO3R0_50TRPF | 3.0                       | B, C                   | 100                       | 0.530                     |
| NMC-M0603NPO3R6_50TRPF | 3.6                       | B, C                   | 100                       | 0.442                     |
| NMC-M0603NPO3R6_50TRPF | 3.9                       | B, C                   | 100                       | 0.408                     |
| NMC-M0603NPO4R3_50TRPF | 4.3                       | B, C                   | 100                       | 0.370                     |
| NMC-M0603NPO4R7_50TRPF | 4.7                       | B, C                   | 100                       | 0.338                     |
| NMC-M0603NPO5R1_50TRPF | 5.1                       | C, D                   | 80                        | 0.390                     |
| NMC-M0603NPO5R6_50TRPF | 5.6                       | C, D                   | 80                        | 0.355                     |
| NMC-M0603NPO6R2_50TRPF | 6.2                       | C, D                   | 80                        | 0.320                     |
| NMC-M0603NPO6R8_50TRPF | 6.8                       | C, D                   | 80                        | 0.292                     |
| NMC-M0603NPO7R5_50TRPF | 7.5                       | C, D                   | 80                        | 0.265                     |
| NMC-M0603NPO8R2_50TRPF | 8.2                       | C, D                   | 80                        | 0.242                     |
| NMC-M0603NPO9R1_50TRPF | 9.1                       | C, D                   | 80                        | 0.218                     |
| NMC-M0603NPO100_50TRPF | 10                        | F, G, J                | 80                        | 0.198                     |
| NMC-M0603NPO120_50TRPF | 12                        | F, G, J                | 70                        | 0.189                     |
| NMC-M0603NPO150_50TRPF | 15                        | F, G, J                | 60                        | 0.176                     |
| NMC-M0603NPO180_50TRPF | 18                        | F, G, J                | 50                        | 0.176                     |
| NMC-M0603NPO200_50TRPF | 20                        | F, G, J                | 30                        | 0.265                     |
| NMC-M0603NPO220_50TRPF | 22                        | F, G, J                | 30                        | 0.241                     |

\*Typical ESR





## 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

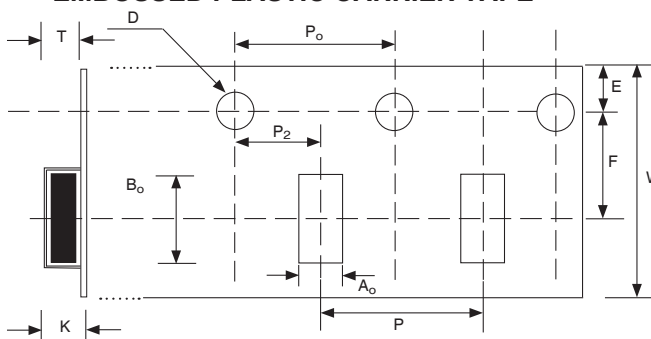
## EMBOSSED PLASTIC CARRIER TAPE DIMENSIONS (mm)

| 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/-0.0</sup> | 0.3    | 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

