

# MLCC with Dipped Radial Lead

Halogen-free, Automotive Grade, High Temperature Application

## FA Series (NP0, X8R)

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|       |            |                                                                                                       |
|-------|------------|-------------------------------------------------------------------------------------------------------|
| Type: | Lead pitch | 5.0 mm                                                                                                |
|       |            | FA28 [4.0x5.5 mm]<br>FA24 [4.5x5.5 mm]<br>FA26 [5.5x6.0 mm]<br>FA20 [5.5x7.0 mm]<br>FA22 [7.5x8.5 mm] |
|       | Lead pitch | 2.5 mm                                                                                                |
|       |            | FA18 [4.0x5.5 mm]<br>FA14 [4.5x5.5 mm]<br>FA16 [5.5x6.0 mm]<br>FA11 [5.5x7.0 mm]                      |



## REMINDERS FOR USING THESE PRODUCTS

Before using these products, be sure to request the delivery specifications.

### SAFETY REMINDERS

Please pay sufficient attention to the warnings for safe designing when using these products.

#### REMINDERS

- Do not use or store in locations where there are conditions such as gas corrosion (salt, acid, alkali, etc.).
- Before soldering, be sure to preheat components.  
The preheating temperature should be set so that the temperature difference between the solder temperature and product temperature does not exceed 150°C.
- Soldering corrections after mounting should be within the range of the conditions determined in the specifications.  
If overheated, a short circuit, performance deterioration, or lifespan shortening may occur.
- Self heating (temperature increase) occurs when the power is turned ON, so the tolerance should be sufficient for the set thermal design.
- Do not use for a purpose outside of the contents regulated in the delivery specifications.
- The products listed on this catalog are intended for use in automotive electronic equipment under a normal operation and use condition.

The products are not designed or warranted to meet the requirements of the applications listed below, whose performance and/or quality require a more stringent level of safety or reliability, or whose failure, malfunction or trouble could cause serious damage to society, person or property.

If you intend to use the products in the applications listed below or if you have special requirements exceeding the range or conditions set forth in the each catalog, please contact us.

- |                                                             |                                                                              |
|-------------------------------------------------------------|------------------------------------------------------------------------------|
| (1) Aerospace/Aviation equipment                            | (8) Public information-processing equipment                                  |
| (2) Transportation equipment (electric trains, ships, etc.) | (9) Military equipment                                                       |
| (3) Medical equipment                                       | (10) Electric heating apparatus, burning equipment                           |
| (4) Power-generation control equipment                      | (11) Disaster prevention/crime prevention equipment                          |
| (5) Atomic energy-related equipment                         | (12) Safety equipment                                                        |
| (6) Seabed equipment                                        | (13) Other applications that are not considered general-purpose applications |
| (7) Transportation control equipment                        |                                                                              |

When designing your equipment even for automotive-purpose applications, you are kindly requested to take into consideration securing protection circuit/device or providing backup circuits in your equipment.

# MLCC with Dipped Radial Lead

Product compatible with RoHS directive  
Halogen-free

Halogen-free, Automotive Grade, High Temperature Application

## Overview of the FA Series

### FEATURES

- A lineup with a rated voltage of 25V to 100V.
- Compatible with a wide capacitance range of 10pF to 4.7μF.
- For guaranteed applications withstanding rigorous temperature environments of up to 150°C.
- The FA series for automotive use is AEC-Q200 compliant.

### APPLICATION

- Noise reduction measures for various motors for automotive use
- Resonant circuits in areas such as keyless entry systems
- Bypass capacitors such as for switching power sources, smoothing capacitors, etc.
- Snubber circuits
- PFC input filters

### PART NUMBER CONSTRUCTION

| FA          | 2               | 8                     | NP0                                     | 1H                | 100                 | D                      |               |                   |  |  |
|-------------|-----------------|-----------------------|-----------------------------------------|-------------------|---------------------|------------------------|---------------|-------------------|--|--|
| Series name | Lead pitch (mm) | LxWxT Dimensions (mm) | Capacitance temperature characteristics | Rated voltage (V) | Nominal capacitance | Capacitance tolerance* | Internal code | Packaging Style** |  |  |
|             | 1 2.5           | 8 4.0x5.5x2.5         | NP0 0±30ppm/°C                          | 1E 25             | 100 10pF            | D ±0.5pF               |               | 0 Bulk            |  |  |
|             | 2 5.0           | 4 4.5x5.5x3.0         | X8R ±15%                                | 1H 50             | 101 100pF           | J ±5%                  |               | 6 Taping          |  |  |
|             |                 | 6 5.5x6.0x3.5         |                                         | 2A 100            | 102 1,000pF         | K ±10%                 |               |                   |  |  |
|             |                 | 0 5.5x7.0x4.0         |                                         |                   | 105 1uF             |                        |               |                   |  |  |
|             |                 | 1 5.5x7.0x4.0         |                                         |                   |                     |                        |               |                   |  |  |
|             |                 | 2 7.5x8.5x4.5         |                                         |                   |                     |                        |               |                   |  |  |

\* Applicable capacitance range: Max. 10 pF for D, over 10 pF for J and K.

\*\* Applied to the TDK's standard specification products.

### OPERATING TEMPERATURE RANGE

| Capacitance temperature characteristics | Operating temperature range |                      |
|-----------------------------------------|-----------------------------|----------------------|
|                                         | Operating temperature       | Storage temperature* |
|                                         | (°C)                        | (°C)                 |
| NP0, X8R                                | -55 to +150                 | -55 to +150          |

\* The Storage temperature range is for after the circuit board is mounted.

- RoHS Directive Compliant Product: See the following for more details related to RoHS Directive compliant products. <http://product.tdk.com/en/environment/rohs/>
- Halogen-free: Indicates that Cl content is less than 900ppm, Br content is less than 900ppm, and that the total Cl and Br content is less than 1500ppm.

Please be sure to request delivery specifications that provide further details on the features and specifications of the products for proper and safe use. Please note that the contents may change without any prior notice due to reasons such as upgrading.

# Overview of the FA Series

## ■ PACKAGE QUANTITY

| Type | Package quantity      |                     |
|------|-----------------------|---------------------|
|      | Taping (pieces / box) | Bulk (pieces / bag) |
| FA28 | 2000                  | 500                 |
| FA24 | 2000                  | 500                 |
| FA26 | 2000                  | 500                 |
| FA20 | 1500                  | 500                 |
| FA22 | 1000                  | 500                 |
| FA18 | 2000                  | 500                 |
| FA14 | 2000                  | 500                 |
| FA16 | 2000                  | 500                 |
| FA11 | 1500                  | 500                 |

# Overview of the FA Series

## RECOMMENDED FLOW PROFILE



| Preheating |           | Peak  |            | Natural cooling |
|------------|-----------|-------|------------|-----------------|
| Temp.      | Time      | Temp. | Time       | Time            |
| T1         | t1        | T2    | t2         | t3              |
| 110°C min. | Over 60s. | 260°C | Within 5s. | Over 60s.       |

# FA28 Type

## ■ SHAPE & DIMENSIONS



# FA28 Type

## ELECTRICAL CHARACTERISTICS

### CHARACTERISTICS SPECIFICATION TABLE

CLASS 1 (TEMPERATURE COMPENSATION)

| Temperature characteristics | Capacitance | Tolerance | Rated voltage<br>Edc (V) | Part No.*           |
|-----------------------------|-------------|-----------|--------------------------|---------------------|
| NP0                         | 10pF        | ±0.5pF    | 50                       | FA28NP01H100DNU0□** |
| NP0                         | 15pF        | ±5%       | 50                       | FA28NP01H150JNU0□   |
| NP0                         | 22pF        | ±5%       | 50                       | FA28NP01H220JNU0□   |
| NP0                         | 33pF        | ±5%       | 50                       | FA28NP01H330JNU0□   |
| NP0                         | 47pF        | ±5%       | 50                       | FA28NP01H470JNU0□   |
| NP0                         | 68pF        | ±5%       | 50                       | FA28NP01H680JNU0□   |
| NP0                         | 100pF       | ±5%       | 50                       | FA28NP01H101JNU0□   |
| NP0                         | 120pF       | ±5%       | 50                       | FA28NP01H121JNU0□   |
| NP0                         | 150pF       | ±5%       | 50                       | FA28NP01H151JNU0□   |
| NP0                         | 180pF       | ±5%       | 50                       | FA28NP01H181JNU0□   |
| NP0                         | 220pF       | ±5%       | 50                       | FA28NP01H221JNU0□   |
| NP0                         | 270pF       | ±5%       | 50                       | FA28NP01H271JNU0□   |
| NP0                         | 330pF       | ±5%       | 50                       | FA28NP01H331JNU0□   |
| NP0                         | 390pF       | ±5%       | 50                       | FA28NP01H391JNU0□   |
| NP0                         | 470pF       | ±5%       | 50                       | FA28NP01H471JNU0□   |
| NP0                         | 560pF       | ±5%       | 50                       | FA28NP01H561JNU0□   |
| NP0                         | 680pF       | ±5%       | 50                       | FA28NP01H681JNU0□   |
| NP0                         | 820pF       | ±5%       | 50                       | FA28NP01H821JNU0□   |
| NP0                         | 1nF         | ±5%       | 50                       | FA28NP01H102JNU0□   |
| NP0                         | 1.2nF       | ±5%       | 50                       | FA28NP01H122JNU0□   |
| NP0                         | 1.5nF       | ±5%       | 50                       | FA28NP01H152JNU0□   |
| NP0                         | 1.8nF       | ±5%       | 50                       | FA28NP01H182JNU0□   |
| NP0                         | 2.2nF       | ±5%       | 50                       | FA28NP01H222JNU0□   |
| NP0                         | 2.7nF       | ±5%       | 50                       | FA28NP01H272JNU0□   |
| NP0                         | 3.3nF       | ±5%       | 50                       | FA28NP01H332JNU0□   |
| NP0                         | 3.9nF       | ±5%       | 50                       | FA28NP01H392JNU0□   |
| NP0                         | 4.7nF       | ±5%       | 50                       | FA28NP01H472JNU0□   |
| NP0                         | 5.6nF       | ±5%       | 50                       | FA28NP01H562JNU0□   |
| NP0                         | 6.8nF       | ±5%       | 50                       | FA28NP01H682JNU0□   |
| NP0                         | 8.2nF       | ±5%       | 50                       | FA28NP01H822JNU0□   |
| NP0                         | 10nF        | ±5%       | 50                       | FA28NP01H103JNU0□   |
| NP0                         | 10pF        | ±0.5pF    | 100                      | FA28NP02A100DNU0□   |
| NP0                         | 15pF        | ±5%       | 100                      | FA28NP02A150JNU0□   |
| NP0                         | 22pF        | ±5%       | 100                      | FA28NP02A220JNU0□   |
| NP0                         | 33pF        | ±5%       | 100                      | FA28NP02A330JNU0□   |
| NP0                         | 47pF        | ±5%       | 100                      | FA28NP02A470JNU0□   |
| NP0                         | 68pF        | ±5%       | 100                      | FA28NP02A680JNU0□   |
| NP0                         | 100pF       | ±5%       | 100                      | FA28NP02A101JNU0□   |
| NP0                         | 120pF       | ±5%       | 100                      | FA28NP02A121JNU0□   |
| NP0                         | 150pF       | ±5%       | 100                      | FA28NP02A151JNU0□   |
| NP0                         | 180pF       | ±5%       | 100                      | FA28NP02A181JNU0□   |
| NP0                         | 220pF       | ±5%       | 100                      | FA28NP02A221JNU0□   |
| NP0                         | 270pF       | ±5%       | 100                      | FA28NP02A271JNU0□   |
| NP0                         | 330pF       | ±5%       | 100                      | FA28NP02A331JNU0□   |
| NP0                         | 390pF       | ±5%       | 100                      | FA28NP02A391JNU0□   |
| NP0                         | 470pF       | ±5%       | 100                      | FA28NP02A471JNU0□   |
| NP0                         | 560pF       | ±5%       | 100                      | FA28NP02A561JNU0□   |
| NP0                         | 680pF       | ±5%       | 100                      | FA28NP02A681JNU0□   |
| NP0                         | 820pF       | ±5%       | 100                      | FA28NP02A821JNU0□   |
| NP0                         | 1nF         | ±5%       | 100                      | FA28NP02A102JNU0□   |
| NP0                         | 1.2nF       | ±5%       | 100                      | FA28NP02A122JNU0□   |
| NP0                         | 1.5nF       | ±5%       | 100                      | FA28NP02A152JNU0□   |
| NP0                         | 1.8nF       | ±5%       | 100                      | FA28NP02A182JNU0□   |
| NP0                         | 2.2nF       | ±5%       | 100                      | FA28NP02A222JNU0□   |
| NP0                         | 2.7nF       | ±5%       | 100                      | FA28NP02A272JNU0□   |
| NP0                         | 3.3nF       | ±5%       | 100                      | FA28NP02A332JNU0□   |

\* The part numbers are TDK's standard specification products.

\*\* The "□" of the Part Number contains the packaging symbol, 0 (Bulk packaging) or 6 (Taping packaging).

# FA28 Type

## ELECTRICAL CHARACTERISTICS

### CHARACTERISTICS SPECIFICATION TABLE

CLASS 2 (TEMPERATURE STABLE)

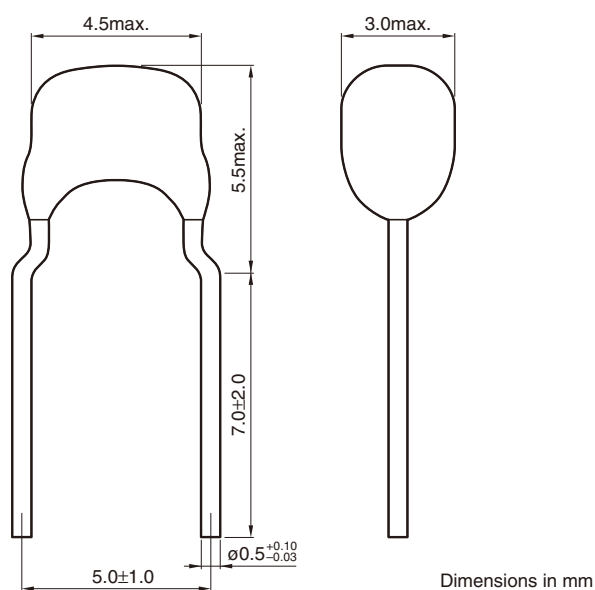
| Temperature characteristics | Capacitance | Tolerance | Rated voltage<br>Edc (V) | Part No.*           |
|-----------------------------|-------------|-----------|--------------------------|---------------------|
| X8R                         | 68nF        | ±10%      | 25                       | FA28X8R1E683KNU0□** |
| X8R                         | 100nF       | ±10%      | 25                       | FA28X8R1E104KNU0□   |
| X8R                         | 150nF       | ±10%      | 25                       | FA28X8R1E154KRU0□   |
| X8R                         | 220nF       | ±10%      | 25                       | FA28X8R1E224KRU0□   |
| X8R                         | 1nF         | ±10%      | 50                       | FA28X8R1H102KNU0□   |
| X8R                         | 1.5nF       | ±10%      | 50                       | FA28X8R1H152KNU0□   |
| X8R                         | 2.2nF       | ±10%      | 50                       | FA28X8R1H222KNU0□   |
| X8R                         | 3.3nF       | ±10%      | 50                       | FA28X8R1H332KNU0□   |
| X8R                         | 4.7nF       | ±10%      | 50                       | FA28X8R1H472KNU0□   |
| X8R                         | 6.8nF       | ±10%      | 50                       | FA28X8R1H682KNU0□   |
| X8R                         | 10nF        | ±10%      | 50                       | FA28X8R1H103KNU0□   |
| X8R                         | 15nF        | ±10%      | 50                       | FA28X8R1H153KNU0□   |
| X8R                         | 22nF        | ±10%      | 50                       | FA28X8R1H223KNU0□   |
| X8R                         | 33nF        | ±10%      | 50                       | FA28X8R1H333KNU0□   |
| X8R                         | 47nF        | ±10%      | 50                       | FA28X8R1H473KNU0□   |
| X8R                         | 68nF        | ±10%      | 50                       | FA28X8R1H683KRU0□   |
| X8R                         | 100nF       | ±10%      | 50                       | FA28X8R1H104KRU0□   |
| X8R                         | 1nF         | ±10%      | 100                      | FA28X8R2A102KNU0□   |
| X8R                         | 1.5nF       | ±10%      | 100                      | FA28X8R2A152KNU0□   |
| X8R                         | 2.2nF       | ±10%      | 100                      | FA28X8R2A222KNU0□   |
| X8R                         | 3.3nF       | ±10%      | 100                      | FA28X8R2A332KNU0□   |
| X8R                         | 4.7nF       | ±10%      | 100                      | FA28X8R2A472KNU0□   |
| X8R                         | 6.8nF       | ±10%      | 100                      | FA28X8R2A682KNU0□   |
| X8R                         | 10nF        | ±10%      | 100                      | FA28X8R2A103KNU0□   |
| X8R                         | 15nF        | ±10%      | 100                      | FA28X8R2A153KNU0□   |
| X8R                         | 22nF        | ±10%      | 100                      | FA28X8R2A223KRU0□   |
| X8R                         | 33nF        | ±10%      | 100                      | FA28X8R2A333KRU0□   |

\* The part numbers are TDK's standard specification products.

\*\* The "□" of the Part Number contains the packaging symbol, 0 (Bulk packaging) or 6 (Taping packaging).

# FA24 Type

## ■ SHAPE & DIMENSIONS



# FA24 Type

## ELECTRICAL CHARACTERISTICS

### CHARACTERISTICS SPECIFICATION TABLE

#### CLASS 1 (TEMPERATURE COMPENSATION)

| Temperature characteristics | Capacitance | Tolerance | Rated voltage<br>Edc (V) | Part No.*           |
|-----------------------------|-------------|-----------|--------------------------|---------------------|
| NP0                         | 15nF        | ±5%       | 50                       | FA24NP01H153JNU0□** |
| NP0                         | 22nF        | ±5%       | 50                       | FA24NP01H223JNU0□   |
| NP0                         | 33nF        | ±5%       | 50                       | FA24NP01H333JNU0□   |
| NP0                         | 3.9nF       | ±5%       | 100                      | FA24NP02A392JNU0□   |
| NP0                         | 4.7nF       | ±5%       | 100                      | FA24NP02A472JNU0□   |
| NP0                         | 5.6nF       | ±5%       | 100                      | FA24NP02A562JNU0□   |
| NP0                         | 6.8nF       | ±5%       | 100                      | FA24NP02A682JNU0□   |
| NP0                         | 8.2nF       | ±5%       | 100                      | FA24NP02A822JNU0□   |
| NP0                         | 10nF        | ±5%       | 100                      | FA24NP02A103JNU0□   |

\* The part numbers are TDK's standard specification products.

\*\* The "□" of the Part Number contains the packaging symbol, 0 (Bulk packaging) or 6 (Taping packaging).

#### CLASS 2 (TEMPERATURE STABLE)

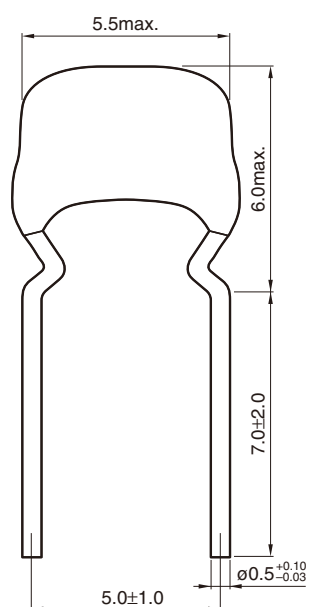
| Temperature characteristics | Capacitance | Tolerance | Rated voltage<br>Edc (V) | Part No.*           |
|-----------------------------|-------------|-----------|--------------------------|---------------------|
| X8R                         | 150nF       | ±10%      | 25                       | FA24X8R1E154KNU0□** |
| X8R                         | 220nF       | ±10%      | 25                       | FA24X8R1E224KNU0□   |
| X8R                         | 330nF       | ±10%      | 25                       | FA24X8R1E334KNU0□   |
| X8R                         | 470nF       | ±10%      | 25                       | FA24X8R1E474KRU0□   |
| X8R                         | 68nF        | ±10%      | 50                       | FA24X8R1H683KNU0□   |
| X8R                         | 100nF       | ±10%      | 50                       | FA24X8R1H104KNU0□   |
| X8R                         | 150nF       | ±10%      | 50                       | FA24X8R1H154KRU0□   |
| X8R                         | 220nF       | ±10%      | 50                       | FA24X8R1H224KRU0□   |
| X8R                         | 22nF        | ±10%      | 100                      | FA24X8R2A223KNU0□   |
| X8R                         | 47nF        | ±10%      | 100                      | FA24X8R2A473KRU0□   |
| X8R                         | 68nF        | ±10%      | 100                      | FA24X8R2A683KRU0□   |

\* The part numbers are TDK's standard specification products.

\*\* The "□" of the Part Number contains the packaging symbol, 0 (Bulk packaging) or 6 (Taping packaging).

# FA26 Type

## ■ SHAPE & DIMENSIONS



Dimensions in mm



# FA26 Type

## ELECTRICAL CHARACTERISTICS

### CHARACTERISTICS SPECIFICATION TABLE

#### CLASS 1 (TEMPERATURE COMPENSATION)

| Temperature characteristics | Capacitance | Tolerance | Rated voltage<br>Edc (V) | Part No.*           |
|-----------------------------|-------------|-----------|--------------------------|---------------------|
| NPO                         | 47nF        | ±5%       | 50                       | FA26NP01H473JNU0□** |
| NPO                         | 68nF        | ±5%       | 50                       | FA26NP01H683JNU0□   |
| NPO                         | 100nF       | ±5%       | 50                       | FA26NP01H104JNU0□   |
| NPO                         | 15nF        | ±5%       | 100                      | FA26NP02A153JNU0□   |
| NPO                         | 22nF        | ±5%       | 100                      | FA26NP02A223JNU0□   |
| NPO                         | 33nF        | ±5%       | 100                      | FA26NP02A333JNU0□   |

\* The part numbers are TDK's standard specification products.

\*\* The "□" of the Part Number contains the packaging symbol, 0 (Bulk packaging) or 6 (Taping packaging).

#### CLASS 2 (TEMPERATURE STABLE)

| Temperature characteristics | Capacitance | Tolerance | Rated voltage<br>Edc (V) | Part No.*           |
|-----------------------------|-------------|-----------|--------------------------|---------------------|
| X8R                         | 470nF       | ±10%      | 25                       | FA26X8R1E474KNU0□** |
| X8R                         | 680nF       | ±10%      | 25                       | FA26X8R1E684KNU0□   |
| X8R                         | 1uF         | ±10%      | 25                       | FA26X8R1E105KNU0□   |
| X8R                         | 1.5uF       | ±10%      | 25                       | FA26X8R1E155KRU0□   |
| X8R                         | 2.2uF       | ±10%      | 25                       | FA26X8R1E225KRU0□   |
| X8R                         | 150nF       | ±10%      | 50                       | FA26X8R1H154KNU0□   |
| X8R                         | 220nF       | ±10%      | 50                       | FA26X8R1H224KNU0□   |
| X8R                         | 330nF       | ±10%      | 50                       | FA26X8R1H334KNU0□   |
| X8R                         | 470nF       | ±10%      | 50                       | FA26X8R1H474KNU0□   |
| X8R                         | 680nF       | ±10%      | 50                       | FA26X8R1H684KRU0□   |
| X8R                         | 1uF         | ±10%      | 50                       | FA26X8R1H105KRU0□   |
| X8R                         | 33nF        | ±10%      | 100                      | FA26X8R2A333KNU0□   |
| X8R                         | 47nF        | ±10%      | 100                      | FA26X8R2A473KNU0□   |
| X8R                         | 68nF        | ±10%      | 100                      | FA26X8R2A683KNU0□   |
| X8R                         | 100nF       | ±10%      | 100                      | FA26X8R2A104KNU0□   |
| X8R                         | 150nF       | ±10%      | 100                      | FA26X8R2A154KNU0□   |
| X8R                         | 220nF       | ±10%      | 100                      | FA26X8R2A224KRU0□   |
| X8R                         | 330nF       | ±10%      | 100                      | FA26X8R2A334KRU0□   |

\* The part numbers are TDK's standard specification products.

\*\* The "□" of the Part Number contains the packaging symbol, 0 (Bulk packaging) or 6 (Taping packaging).

# FA20 Type

## ■ SHAPE & DIMENSIONS



Dimensions in mm



# FA20 Type

## ELECTRICAL CHARACTERISTICS

### CHARACTERISTICS SPECIFICATION TABLE

#### CLASS 1 (TEMPERATURE COMPENSATION)

| Temperature characteristics | Capacitance | Tolerance | Rated voltage<br>Edc (V) | Part No.*           |
|-----------------------------|-------------|-----------|--------------------------|---------------------|
| NPO                         | 47nF        | ±5%       | 100                      | FA20NP02A473JNU0□** |
| NPO                         | 68nF        | ±5%       | 100                      | FA20NP02A683JNU0□   |

\* The part numbers are TDK's standard specification products.

\*\* The "□" of the Part Number contains the packaging symbol, 0 (Bulk packaging) or 6 (Taping packaging).

#### CLASS 2 (TEMPERATURE STABLE)

| Temperature characteristics | Capacitance | Tolerance | Rated voltage<br>Edc (V) | Part No.*           |
|-----------------------------|-------------|-----------|--------------------------|---------------------|
| X8R                         | 1.5uF       | ±10%      | 25                       | FA20X8R1E155KNU0□** |
| X8R                         | 2.2uF       | ±10%      | 25                       | FA20X8R1E225KNU0□   |
| X8R                         | 3.3uF       | ±10%      | 25                       | FA20X8R1E335KNU0□   |
| X8R                         | 4.7uF       | ±10%      | 25                       | FA20X8R1E475KRU0□   |
| X8R                         | 470nF       | ±10%      | 100                      | FA20X8R2A474KRU0□   |
| X8R                         | 680nF       | ±10%      | 100                      | FA20X8R2A684KRU0□   |

\* The part numbers are TDK's standard specification products.

\*\* The "□" of the Part Number contains the packaging symbol, 0 (Bulk packaging) or 6 (Taping packaging).

# FA22 Type

## ■ SHAPE & DIMENSIONS



Dimensions in mm



# FA22 Type

## ■ ELECTRICAL CHARACTERISTICS

### □ CHARACTERISTICS SPECIFICATION TABLE

CLASS 1 (TEMPERATURE COMPENSATION)

| Temperature characteristics | Capacitance | Tolerance | Rated voltage<br>Edc (V) | Part No.*           |
|-----------------------------|-------------|-----------|--------------------------|---------------------|
| NPO                         | 150nF       | ±5%       | 50                       | FA22NP01H154JNU0□** |
| NPO                         | 220nF       | ±5%       | 50                       | FA22NP01H224JNU0□   |
| NPO                         | 100nF       | ±5%       | 100                      | FA22NP02A104JNU0□   |

\* The part numbers are TDK's standard specification products.

\*\* The "□" of the Part Number contains the packaging symbol, 0 (Bulk packaging) or 6 (Taping packaging).

# FA18 Type

## ■ SHAPE & DIMENSIONS



# FA18 Type

## ELECTRICAL CHARACTERISTICS

### CHARACTERISTICS SPECIFICATION TABLE

CLASS 1 (TEMPERATURE COMPENSATION)

| Temperature characteristics | Capacitance | Tolerance | Rated voltage<br>Edc (V) | Part No.*           |
|-----------------------------|-------------|-----------|--------------------------|---------------------|
| NP0                         | 10pF        | ±0.5pF    | 50                       | FA18NP01H100DNU0□** |
| NP0                         | 15pF        | ±5%       | 50                       | FA18NP01H150JNU0□   |
| NP0                         | 22pF        | ±5%       | 50                       | FA18NP01H220JNU0□   |
| NP0                         | 33pF        | ±5%       | 50                       | FA18NP01H330JNU0□   |
| NP0                         | 47pF        | ±5%       | 50                       | FA18NP01H470JNU0□   |
| NP0                         | 68pF        | ±5%       | 50                       | FA18NP01H680JNU0□   |
| NP0                         | 100pF       | ±5%       | 50                       | FA18NP01H101JNU0□   |
| NP0                         | 120pF       | ±5%       | 50                       | FA18NP01H121JNU0□   |
| NP0                         | 150pF       | ±5%       | 50                       | FA18NP01H151JNU0□   |
| NP0                         | 180pF       | ±5%       | 50                       | FA18NP01H181JNU0□   |
| NP0                         | 220pF       | ±5%       | 50                       | FA18NP01H221JNU0□   |
| NP0                         | 270pF       | ±5%       | 50                       | FA18NP01H271JNU0□   |
| NP0                         | 330pF       | ±5%       | 50                       | FA18NP01H331JNU0□   |
| NP0                         | 390pF       | ±5%       | 50                       | FA18NP01H391JNU0□   |
| NP0                         | 470pF       | ±5%       | 50                       | FA18NP01H471JNU0□   |
| NP0                         | 560pF       | ±5%       | 50                       | FA18NP01H561JNU0□   |
| NP0                         | 680pF       | ±5%       | 50                       | FA18NP01H681JNU0□   |
| NP0                         | 820pF       | ±5%       | 50                       | FA18NP01H821JNU0□   |
| NP0                         | 1nF         | ±5%       | 50                       | FA18NP01H102JNU0□   |
| NP0                         | 1.2nF       | ±5%       | 50                       | FA18NP01H122JNU0□   |
| NP0                         | 1.5nF       | ±5%       | 50                       | FA18NP01H152JNU0□   |
| NP0                         | 1.8nF       | ±5%       | 50                       | FA18NP01H182JNU0□   |
| NP0                         | 2.2nF       | ±5%       | 50                       | FA18NP01H222JNU0□   |
| NP0                         | 2.7nF       | ±5%       | 50                       | FA18NP01H272JNU0□   |
| NP0                         | 3.3nF       | ±5%       | 50                       | FA18NP01H332JNU0□   |
| NP0                         | 3.9nF       | ±5%       | 50                       | FA18NP01H392JNU0□   |
| NP0                         | 4.7nF       | ±5%       | 50                       | FA18NP01H472JNU0□   |
| NP0                         | 5.6nF       | ±5%       | 50                       | FA18NP01H562JNU0□   |
| NP0                         | 6.8nF       | ±5%       | 50                       | FA18NP01H682JNU0□   |
| NP0                         | 8.2nF       | ±5%       | 50                       | FA18NP01H822JNU0□   |
| NP0                         | 10nF        | ±5%       | 50                       | FA18NP01H103JNU0□   |
| NP0                         | 10pF        | ±0.5pF    | 100                      | FA18NP02A100DNU0□   |
| NP0                         | 15pF        | ±5%       | 100                      | FA18NP02A150JNU0□   |
| NP0                         | 22pF        | ±5%       | 100                      | FA18NP02A220JNU0□   |
| NP0                         | 33pF        | ±5%       | 100                      | FA18NP02A330JNU0□   |
| NP0                         | 47pF        | ±5%       | 100                      | FA18NP02A470JNU0□   |
| NP0                         | 68pF        | ±5%       | 100                      | FA18NP02A680JNU0□   |
| NP0                         | 100pF       | ±5%       | 100                      | FA18NP02A101JNU0□   |
| NP0                         | 120pF       | ±5%       | 100                      | FA18NP02A121JNU0□   |
| NP0                         | 150pF       | ±5%       | 100                      | FA18NP02A151JNU0□   |
| NP0                         | 180pF       | ±5%       | 100                      | FA18NP02A181JNU0□   |
| NP0                         | 220pF       | ±5%       | 100                      | FA18NP02A221JNU0□   |
| NP0                         | 270pF       | ±5%       | 100                      | FA18NP02A271JNU0□   |
| NP0                         | 330pF       | ±5%       | 100                      | FA18NP02A331JNU0□   |
| NP0                         | 390pF       | ±5%       | 100                      | FA18NP02A391JNU0□   |
| NP0                         | 470pF       | ±5%       | 100                      | FA18NP02A471JNU0□   |
| NP0                         | 560pF       | ±5%       | 100                      | FA18NP02A561JNU0□   |
| NP0                         | 680pF       | ±5%       | 100                      | FA18NP02A681JNU0□   |
| NP0                         | 820pF       | ±5%       | 100                      | FA18NP02A821JNU0□   |
| NP0                         | 1nF         | ±5%       | 100                      | FA18NP02A102JNU0□   |
| NP0                         | 1.2nF       | ±5%       | 100                      | FA18NP02A122JNU0□   |
| NP0                         | 1.5nF       | ±5%       | 100                      | FA18NP02A152JNU0□   |
| NP0                         | 1.8nF       | ±5%       | 100                      | FA18NP02A182JNU0□   |
| NP0                         | 2.2nF       | ±5%       | 100                      | FA18NP02A222JNU0□   |
| NP0                         | 2.7nF       | ±5%       | 100                      | FA18NP02A272JNU0□   |
| NP0                         | 3.3nF       | ±5%       | 100                      | FA18NP02A332JNU0□   |

\* The part numbers are TDK's standard specification products.

\*\* The "□" of the Part Number contains the packaging symbol, 0 (Bulk packaging) or 6 (Taping packaging).

# FA18 Type

## ELECTRICAL CHARACTERISTICS

### CHARACTERISTICS SPECIFICATION TABLE

CLASS 2 (TEMPERATURE STABLE)

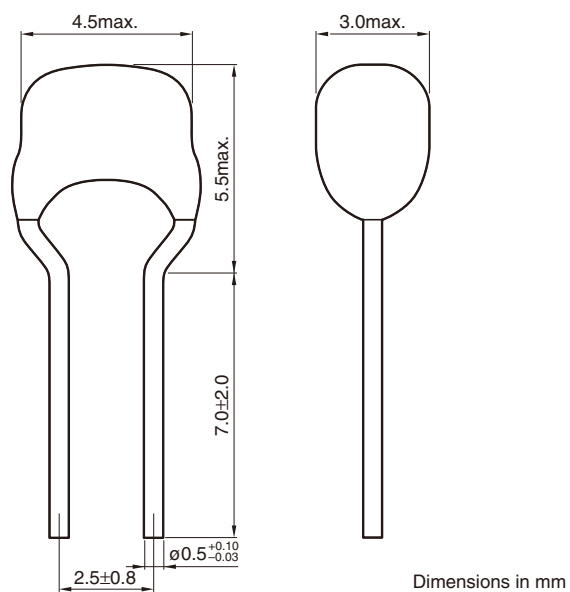
| Temperature characteristics | Capacitance | Tolerance | Rated voltage<br>Edc (V) | Part No.*           |
|-----------------------------|-------------|-----------|--------------------------|---------------------|
| X8R                         | 68nF        | ±10%      | 25                       | FA18X8R1E683KNU0□** |
| X8R                         | 100nF       | ±10%      | 25                       | FA18X8R1E104KNU0□   |
| X8R                         | 150nF       | ±10%      | 25                       | FA18X8R1E154KRU0□   |
| X8R                         | 220nF       | ±10%      | 25                       | FA18X8R1E224KRU0□   |
| X8R                         | 1nF         | ±10%      | 50                       | FA18X8R1H102KNU0□   |
| X8R                         | 1.5nF       | ±10%      | 50                       | FA18X8R1H152KNU0□   |
| X8R                         | 2.2nF       | ±10%      | 50                       | FA18X8R1H222KNU0□   |
| X8R                         | 3.3nF       | ±10%      | 50                       | FA18X8R1H332KNU0□   |
| X8R                         | 4.7nF       | ±10%      | 50                       | FA18X8R1H472KNU0□   |
| X8R                         | 6.8nF       | ±10%      | 50                       | FA18X8R1H682KNU0□   |
| X8R                         | 10nF        | ±10%      | 50                       | FA18X8R1H103KNU0□   |
| X8R                         | 15nF        | ±10%      | 50                       | FA18X8R1H153KNU0□   |
| X8R                         | 22nF        | ±10%      | 50                       | FA18X8R1H223KNU0□   |
| X8R                         | 33nF        | ±10%      | 50                       | FA18X8R1H333KNU0□   |
| X8R                         | 47nF        | ±10%      | 50                       | FA18X8R1H473KNU0□   |
| X8R                         | 68nF        | ±10%      | 50                       | FA18X8R1H683KRU0□   |
| X8R                         | 100nF       | ±10%      | 50                       | FA18X8R1H104KRU0□   |
| X8R                         | 1nF         | ±10%      | 100                      | FA18X8R2A102KNU0□   |
| X8R                         | 1.5nF       | ±10%      | 100                      | FA18X8R2A152KNU0□   |
| X8R                         | 2.2nF       | ±10%      | 100                      | FA18X8R2A222KNU0□   |
| X8R                         | 3.3nF       | ±10%      | 100                      | FA18X8R2A332KNU0□   |
| X8R                         | 4.7nF       | ±10%      | 100                      | FA18X8R2A472KNU0□   |
| X8R                         | 6.8nF       | ±10%      | 100                      | FA18X8R2A682KNU0□   |
| X8R                         | 10nF        | ±10%      | 100                      | FA18X8R2A103KNU0□   |
| X8R                         | 15nF        | ±10%      | 100                      | FA18X8R2A153KNU0□   |
| X8R                         | 22nF        | ±10%      | 100                      | FA18X8R2A223KRU0□   |
| X8R                         | 33nF        | ±10%      | 100                      | FA18X8R2A333KRU0□   |

\* The part numbers are TDK's standard specification products.

\*\* The "□" of the Part Number contains the packaging symbol, 0 (Bulk packaging) or 6 (Taping packaging).

# FA14 Type

## ■ SHAPE & DIMENSIONS



# FA14 Type

## ELECTRICAL CHARACTERISTICS

### CHARACTERISTICS SPECIFICATION TABLE

#### CLASS 1 (TEMPERATURE COMPENSATION)

| Temperature characteristics | Capacitance | Tolerance | Rated voltage<br>Edc (V) | Part No.*           |
|-----------------------------|-------------|-----------|--------------------------|---------------------|
| NP0                         | 15nF        | ±5%       | 50                       | FA14NP01H153JNU0□** |
| NP0                         | 22nF        | ±5%       | 50                       | FA14NP01H223JNU0□   |
| NP0                         | 33nF        | ±5%       | 50                       | FA14NP01H333JNU0□   |
| NP0                         | 3.9nF       | ±5%       | 100                      | FA14NP02A392JNU0□   |
| NP0                         | 4.7nF       | ±5%       | 100                      | FA14NP02A472JNU0□   |
| NP0                         | 5.6nF       | ±5%       | 100                      | FA14NP02A562JNU0□   |
| NP0                         | 6.8nF       | ±5%       | 100                      | FA14NP02A682JNU0□   |
| NP0                         | 8.2nF       | ±5%       | 100                      | FA14NP02A822JNU0□   |
| NP0                         | 10nF        | ±5%       | 100                      | FA14NP02A103JNU0□   |

\* The part numbers are TDK's standard specification products.

\*\* The "□" of the Part Number contains the packaging symbol, 0 (Bulk packaging) or 6 (Taping packaging).

#### CLASS 2 (TEMPERATURE STABLE)

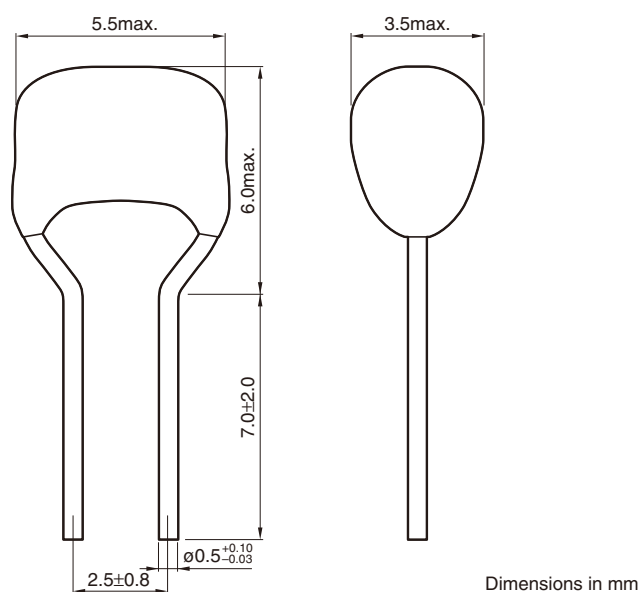
| Temperature characteristics | Capacitance | Tolerance | Rated voltage<br>Edc (V) | Part No.*           |
|-----------------------------|-------------|-----------|--------------------------|---------------------|
| X8R                         | 150nF       | ±10%      | 25                       | FA14X8R1E154KNU0□** |
| X8R                         | 220nF       | ±10%      | 25                       | FA14X8R1E224KNU0□   |
| X8R                         | 330nF       | ±10%      | 25                       | FA14X8R1E334KNU0□   |
| X8R                         | 470nF       | ±10%      | 25                       | FA14X8R1E474KRU0□   |
| X8R                         | 68nF        | ±10%      | 50                       | FA14X8R1H683KNU0□   |
| X8R                         | 100nF       | ±10%      | 50                       | FA14X8R1H104KNU0□   |
| X8R                         | 150nF       | ±10%      | 50                       | FA14X8R1H154KRU0□   |
| X8R                         | 220nF       | ±10%      | 50                       | FA14X8R1H224KRU0□   |
| X8R                         | 22nF        | ±10%      | 100                      | FA14X8R2A223KNU0□   |
| X8R                         | 47nF        | ±10%      | 100                      | FA14X8R2A473KRU0□   |
| X8R                         | 68nF        | ±10%      | 100                      | FA14X8R2A683KRU0□   |

\* The part numbers are TDK's standard specification products.

\*\* The "□" of the Part Number contains the packaging symbol, 0 (Bulk packaging) or 6 (Taping packaging).

# FA16 Type

## ■ SHAPE & DIMENSIONS



# FA16 Type

## ELECTRICAL CHARACTERISTICS

### CHARACTERISTICS SPECIFICATION TABLE

#### CLASS 1 (TEMPERATURE COMPENSATION)

| Temperature characteristics | Capacitance | Tolerance | Rated voltage<br>Edc (V) | Part No.*           |
|-----------------------------|-------------|-----------|--------------------------|---------------------|
| NPO                         | 47nF        | ±5%       | 50                       | FA16NP01H473JNU0□** |
| NPO                         | 68nF        | ±5%       | 50                       | FA16NP01H683JNU0□   |
| NPO                         | 100nF       | ±5%       | 50                       | FA16NP01H104JNU0□   |
| NPO                         | 15nF        | ±5%       | 100                      | FA16NP02A153JNU0□   |
| NPO                         | 22nF        | ±5%       | 100                      | FA16NP02A223JNU0□   |
| NPO                         | 33nF        | ±5%       | 100                      | FA16NP02A333JNU0□   |

\* The part numbers are TDK's standard specification products.

\*\* The "□" of the Part Number contains the packaging symbol, 0 (Bulk packaging) or 6 (Taping packaging).

#### CLASS 2 (TEMPERATURE STABLE)

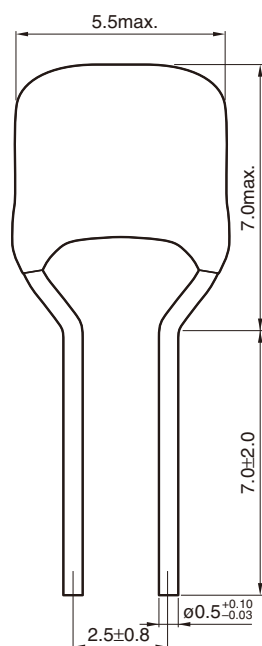
| Temperature characteristics | Capacitance | Tolerance | Rated voltage<br>Edc (V) | Part No.*           |
|-----------------------------|-------------|-----------|--------------------------|---------------------|
| X8R                         | 470nF       | ±10%      | 25                       | FA16X8R1E474KNU0□** |
| X8R                         | 680nF       | ±10%      | 25                       | FA16X8R1E684KNU0□   |
| X8R                         | 1uF         | ±10%      | 25                       | FA16X8R1E105KNU0□   |
| X8R                         | 1.5uF       | ±10%      | 25                       | FA16X8R1E155KRU0□   |
| X8R                         | 2.2uF       | ±10%      | 25                       | FA16X8R1E225KRU0□   |
| X8R                         | 150nF       | ±10%      | 50                       | FA16X8R1H154KNU0□   |
| X8R                         | 220nF       | ±10%      | 50                       | FA16X8R1H224KNU0□   |
| X8R                         | 330nF       | ±10%      | 50                       | FA16X8R1H334KNU0□   |
| X8R                         | 470nF       | ±10%      | 50                       | FA16X8R1H474KNU0□   |
| X8R                         | 680nF       | ±10%      | 50                       | FA16X8R1H684KRU0□   |
| X8R                         | 1uF         | ±10%      | 50                       | FA16X8R1H105KRU0□   |
| X8R                         | 33nF        | ±10%      | 100                      | FA16X8R2A333KNU0□   |
| X8R                         | 47nF        | ±10%      | 100                      | FA16X8R2A473KNU0□   |
| X8R                         | 68nF        | ±10%      | 100                      | FA16X8R2A683KNU0□   |
| X8R                         | 100nF       | ±10%      | 100                      | FA16X8R2A104KNU0□   |
| X8R                         | 150nF       | ±10%      | 100                      | FA16X8R2A154KNU0□   |
| X8R                         | 220nF       | ±10%      | 100                      | FA16X8R2A224KRU0□   |
| X8R                         | 330nF       | ±10%      | 100                      | FA16X8R2A334KRU0□   |

\* The part numbers are TDK's standard specification products.

\*\* The "□" of the Part Number contains the packaging symbol, 0 (Bulk packaging) or 6 (Taping packaging).

# FA11 Type

## ■ SHAPE & DIMENSIONS



Dimensions in mm



# FA11 Type

## ELECTRICAL CHARACTERISTICS

### CHARACTERISTICS SPECIFICATION TABLE

#### CLASS 1 (TEMPERATURE COMPENSATION)

| Temperature characteristics | Capacitance | Tolerance | Rated voltage<br>Edc (V) | Part No.*           |
|-----------------------------|-------------|-----------|--------------------------|---------------------|
| NPO                         | 47nF        | ±5%       | 100                      | FA11NP02A473JNU0□** |
| NPO                         | 68nF        | ±5%       | 100                      | FA11NP02A683JNU0□   |

\* The part numbers are TDK's standard specification products.

\*\* The "□" of the Part Number contains the packaging symbol, 0 (Bulk packaging) or 6 (Taping packaging).

#### CLASS 2 (TEMPERATURE STABLE)

| Temperature characteristics | Capacitance | Tolerance | Rated voltage<br>Edc (V) | Part No.*           |
|-----------------------------|-------------|-----------|--------------------------|---------------------|
| X8R                         | 1.5uF       | ±10%      | 25                       | FA11X8R1E155KNU0□** |
| X8R                         | 2.2uF       | ±10%      | 25                       | FA11X8R1E225KNU0□   |
| X8R                         | 3.3uF       | ±10%      | 25                       | FA11X8R1E335KNU0□   |
| X8R                         | 4.7uF       | ±10%      | 25                       | FA11X8R1E475KRU0□   |
| X8R                         | 470nF       | ±10%      | 100                      | FA11X8R2A474KRU0□   |
| X8R                         | 680nF       | ±10%      | 100                      | FA11X8R2A684KRU0□   |

\* The part numbers are TDK's standard specification products.

\*\* The "□" of the Part Number contains the packaging symbol, 0 (Bulk packaging) or 6 (Taping packaging).

# Packaging Style

## TAPING DIMENSIONS

### Lead pitch 5.0 mm

(FA28, FA24, FA26, FA20, FA22 Type)



| Symbol           | Dimensions (mm) |
|------------------|-----------------|
| P                | 12.7±1.0        |
| P0* <sup>1</sup> | 12.7±0.3        |
| P1               | 3.85±0.7        |
| P2               | 6.35±1.3        |
| W0               | 12.0±1.0        |
| W1               | 9.0±0.5         |
| W2* <sup>2</sup> | 3.0max.         |
| W3               | 18.0+1.0, -0.5  |
| H0               | 16.0±0.5        |
| ℓ                | 1.0max.         |
| t                | 0.6±0.2         |
| L0* <sup>3</sup> | 11.0max.        |
| F                | 5.0+0.8         |
| ød               | ø0.5+0.1, -0.03 |
| øD               | ø4.0±0.2        |
| Δh               | 0±2             |

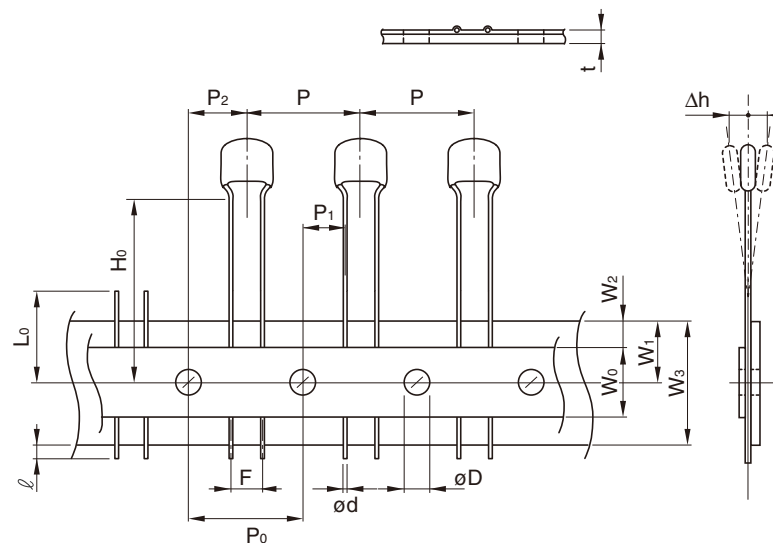
\*<sup>1</sup> Accumulated pitch tolerance shall be ±2mm for 20 pitches.

\*<sup>2</sup> Adhesive tape shall not stick out from carrier tape.

\*<sup>3</sup> The number of consecutive gaps in the product shall be three or less.

### Lead pitch 2.5 mm

(FA18, FA14, FA16, FA11 Type)



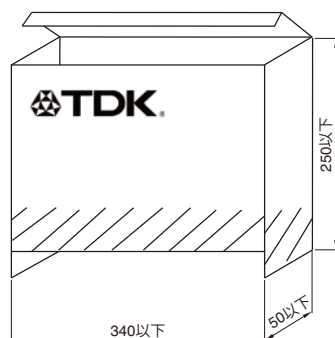
| Symbol           | Dimensions (mm) |
|------------------|-----------------|
| P                | 12.7±1.0        |
| P0* <sup>1</sup> | 12.7±0.3        |
| P1               | 5.1±0.7         |
| P2               | 6.35±1.3        |
| W0               | 12.0±1.0        |
| W1               | 9.0±0.5         |
| W2* <sup>2</sup> | 3.0max.         |
| W3               | 18.0+1.0, -0.5  |
| H0               | 16.0±0.5        |
| ℓ                | 1.0max.         |
| t                | 0.6±0.2         |
| L0* <sup>3</sup> | 11.0max.        |
| F                | 2.5+0.5         |
| ød               | ø0.5+0.1, -0.03 |
| øD               | ø4.0±0.2        |
| Δh               | 0±2             |

\*<sup>1</sup> Accumulated pitch tolerance shall be ±2mm for 20 pitches.

\*<sup>2</sup> Adhesive tape shall not stick out from carrier tape.

\*<sup>3</sup> The number of consecutive gaps in the product shall be three or less.

## AMMO PACK INNER BOX SIZE



Dimensions in mm

⚠ Please be sure to request delivery specifications that provide further details on the features and specifications of the products for proper and safe use. Please note that the contents may change without any prior notice due to reasons such as upgrading.

## Данный компонент на территории Российской Федерации

**Вы можете приобрести в компании MosChip.**

Для оперативного оформления запроса Вам необходимо перейти по данной ссылке:

<http://moschip.ru/get-element>

Вы можете разместить у нас заказ для любого Вашего проекта, будь то серийное производство или разработка единичного прибора.

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Сотрудничество с глобальными дистрибьюторами электронных компонентов, предоставляет возможность заказывать и получать с международных складов практически любой перечень компонентов в оптимальные для Вас сроки.

На всех этапах разработки и производства наши партнеры могут получить квалифицированную поддержку опытных инженеров.

Система менеджмента качества компании отвечает требованиям в соответствии с ГОСТ Р ИСО 9001, ГОСТ РВ 0015-002 и ЭС РД 009

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