



# Capacitor with Multi-layer Lead

Conventional product\*

Commercial Grade

## FK Series

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(\*) For a new design, FA or FG Series with halogen-free specification are recommended.

**Type:**            **General (Up to 50V)**

FK28, FK18

FK24, FK14

FK26, FK16

FK20, FK11

FK22

**Mid Voltage (100 to 630V)**

FK28, FK18

FK24, FK14

FK26, FK16

FK20, FK11

FK22

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# Capacitor with Multi-layer Lead

## Commercial Grade

Product compatible with RoHS directive

# Overview of the FK General (Up to 50V) Series

### FEATURES

- High capacitance has been achieved through improvements in the thinning process of ceramic dielectric layers and multi-layer lamination technology.
- High reliability is maintained under specified environmental conditions.
- Low residual inductance and excellent frequency characteristics has been achieved.
- The leads are formed with a "kink" to achieve consistent insertion heights and facilitate the release of gases during soldering for dramatically improved solderability.
- Taping specifications are available for automatic insertions, which contribute to reduce on-board costs.

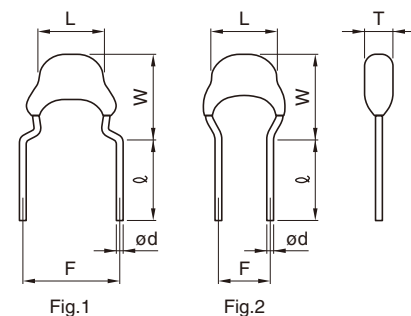
### PRODUCT IDENTIFICATION

FK 28 C0G 1H 101 J □□□□

(1) (2) (3) (4) (5) (6) (7)

(1) Series name

(2) Dimensions and shapes of lead wire



| Type | L max. | W max. | T max. | F       | l      | ød            | Fig |
|------|--------|--------|--------|---------|--------|---------------|-----|
| 28   | 4.0    | 5.5    | 2.5    | 5.0±1.0 | 7±2    | 0.5+0.1,-0.03 | 1   |
| 24   | 4.5    | 5.5    | 2.5    | 5.0±1.0 | 7±2    | 0.5+0.1,-0.03 | 1   |
| 26   | 5.5    | 6.0    | 3.5    | 5.0±1.0 | 7±2    | 0.5+0.1,-0.03 | 1   |
| 20   | 5.5    | 7.0    | 4.0    | 5.0±1.0 | 7±2    | 0.5+0.1,-0.03 | 1   |
| 22   | 7.5    | 8.0    | 4.0    | 5.0±1.0 | 7±2    | 0.5+0.1,-0.03 | 1   |
| 18   | 4.0    | 5.5    | 2.5    | 2.5±0.8 | 5+3,-1 | 0.5+0.1,-0.03 | 2   |
| 14   | 4.5    | 5.5    | 2.5    | 2.5±0.8 | 5+3,-1 | 0.5+0.1,-0.03 | 2   |
| 16   | 5.5    | 6.0    | 3.5    | 2.5±0.8 | 5+3,-1 | 0.5+0.1,-0.03 | 2   |
| 11   | 5.5    | 7.0    | 4.0    | 2.5±0.8 | 5+3,-1 | 0.5+0.1,-0.03 | 2   |

(3) Capacitance temperature characteristics

Class 1 (Temperature compensation)

| Temperature characteristics | Capacitance change | Temperature range |
|-----------------------------|--------------------|-------------------|
| C0G                         | 0±30ppm/°C         | -55 to +125°C     |

Class 2 (Temperature stable and general purpose)

| Temperature characteristics | Capacitance change | Temperature range |
|-----------------------------|--------------------|-------------------|
| X7R                         | ±15%               | -55 to +125°C     |
| X5R                         | ±15%               | -55 to +85°C      |
| X7S                         | ±22%               | -55 to +125°C     |

- Conformity to RoHS Directive: This means that, in conformity with EU Directive 2011/65/EC, lead, cadmium, mercury, hexavalent chromium, and specific bromine-based flame retardants, PBB and PBDE, have not been used, except for exempted applications.

(4) Rated voltage E<sub>dc</sub>

|    |      |
|----|------|
| 0J | 6.3V |
| 1A | 10V  |
| 1C | 16V  |
| 1E | 25V  |
| 1H | 50V  |

(5) Nominal capacitance

The capacitance is expressed in three digit codes and in units of pico farads (pF).

The first and second digits identify the first and second significant figures of the capacitance.

The third digit identifies the multiplier.

|     |         |
|-----|---------|
| 0R5 | 0.5pF   |
| 010 | 1pF     |
| 100 | 10pF    |
| 102 | 1,000pF |

(6) Capacitance tolerance

| Symbol | Tolerance | Applicable capacitance range |
|--------|-----------|------------------------------|
| C      | ±0.25pF   | 10pF max.                    |
| D      | ±0.5pF    |                              |
| J      | ±5%       | Over 10pF                    |
| K      | ±10%      |                              |
| M      | ±20%      |                              |

(7) TDK internal code

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## CAPACITANCE RANGES: CLASS 1 (TEMPERATURE COMPENSATION)

## FK28 AND FK18 TYPES

## SHAPES AND DIMENSIONS



## RATED VOLTAGE Edc: 50V

| Temperature characteristics | Capacitance | Tolerance | Rated voltage Edc(V) | Part No.      |               |
|-----------------------------|-------------|-----------|----------------------|---------------|---------------|
|                             |             |           |                      | FK28 type     | FK18 type     |
| C0G                         | 1pF         | ±0.25pF   | 50                   | FK28C0G1H010C | FK18C0G1H010C |
| C0G                         | 1.5pF       | ±0.25pF   | 50                   | FK28C0G1H1R5C | FK18C0G1H1R5C |
| C0G                         | 2pF         | ±0.25pF   | 50                   | FK28C0G1H020C | FK18C0G1H020C |
| C0G                         | 2.2pF       | ±0.25pF   | 50                   | FK28C0G1H2R2C | FK18C0G1H2R2C |
| C0G                         | 3pF         | ±0.25pF   | 50                   | FK28C0G1H030C | FK18C0G1H030C |
| C0G                         | 3.3pF       | ±0.25pF   | 50                   | FK28C0G1H3R3C | FK18C0G1H3R3C |
| C0G                         | 4pF         | ±0.25pF   | 50                   | FK28C0G1H040C | FK18C0G1H040C |
| C0G                         | 4.7pF       | ±0.25pF   | 50                   | FK28C0G1H4R7C | FK18C0G1H4R7C |
| C0G                         | 5pF         | ±0.25pF   | 50                   | FK28C0G1H050C | FK18C0G1H050C |
| C0G                         | 6pF         | ±0.5pF    | 50                   | FK28C0G1H060D | FK18C0G1H060D |
| C0G                         | 6.8pF       | ±0.5pF    | 50                   | FK28C0G1H6R8D | FK18C0G1H6R8D |
| C0G                         | 7pF         | ±0.5pF    | 50                   | FK28C0G1H070D | FK18C0G1H070D |
| C0G                         | 8pF         | ±0.5pF    | 50                   | FK28C0G1H080D | FK18C0G1H080D |
| C0G                         | 9pF         | ±0.5pF    | 50                   | FK28C0G1H090D | FK18C0G1H090D |
| C0G                         | 10pF        | ±0.5pF    | 50                   | FK28C0G1H100D | FK18C0G1H100D |
| C0G                         | 12pF        | ±5%       | 50                   | FK28C0G1H120J | FK18C0G1H120J |
| C0G                         | 15pF        | ±5%       | 50                   | FK28C0G1H150J | FK18C0G1H150J |
| C0G                         | 18pF        | ±5%       | 50                   | FK28C0G1H180J | FK18C0G1H180J |
| C0G                         | 22pF        | ±5%       | 50                   | FK28C0G1H220J | FK18C0G1H220J |
| C0G                         | 27pF        | ±5%       | 50                   | FK28C0G1H270J | FK18C0G1H270J |
| C0G                         | 33pF        | ±5%       | 50                   | FK28C0G1H330J | FK18C0G1H330J |
| C0G                         | 39pF        | ±5%       | 50                   | FK28C0G1H390J | FK18C0G1H390J |
| C0G                         | 47pF        | ±5%       | 50                   | FK28C0G1H470J | FK18C0G1H470J |
| C0G                         | 56pF        | ±5%       | 50                   | FK28C0G1H560J | FK18C0G1H560J |
| C0G                         | 68pF        | ±5%       | 50                   | FK28C0G1H680J | FK18C0G1H680J |
| C0G                         | 82pF        | ±5%       | 50                   | FK28C0G1H820J | FK18C0G1H820J |
| C0G                         | 100pF       | ±5%       | 50                   | FK28C0G1H101J | FK18C0G1H101J |
| C0G                         | 120pF       | ±5%       | 50                   | FK28C0G1H121J | FK18C0G1H121J |
| C0G                         | 150pF       | ±5%       | 50                   | FK28C0G1H151J | FK18C0G1H151J |
| C0G                         | 180pF       | ±5%       | 50                   | FK28C0G1H181J | FK18C0G1H181J |
| C0G                         | 220pF       | ±5%       | 50                   | FK28C0G1H221J | FK18C0G1H221J |
| C0G                         | 270pF       | ±5%       | 50                   | FK28C0G1H271J | FK18C0G1H271J |
| C0G                         | 330pF       | ±5%       | 50                   | FK28C0G1H331J | FK18C0G1H331J |
| C0G                         | 390pF       | ±5%       | 50                   | FK28C0G1H391J | FK18C0G1H391J |
| C0G                         | 470pF       | ±5%       | 50                   | FK28C0G1H471J | FK18C0G1H471J |
| C0G                         | 560pF       | ±5%       | 50                   | FK28C0G1H561J | FK18C0G1H561J |
| C0G                         | 680pF       | ±5%       | 50                   | FK28C0G1H681J | FK18C0G1H681J |
| C0G                         | 820pF       | ±5%       | 50                   | FK28C0G1H821J | FK18C0G1H821J |
| C0G                         | 1000pF      | ±5%       | 50                   | FK28C0G1H102J | FK18C0G1H102J |
| C0G                         | 1200pF      | ±5%       | 50                   | FK28C0G1H122J | FK18C0G1H122J |
| C0G                         | 1500pF      | ±5%       | 50                   | FK28C0G1H152J | FK18C0G1H152J |
| C0G                         | 1800pF      | ±5%       | 50                   | FK28C0G1H182J | FK18C0G1H182J |
| C0G                         | 2200pF      | ±5%       | 50                   | FK28C0G1H222J | FK18C0G1H222J |
| C0G                         | 2700pF      | ±5%       | 50                   | FK28C0G1H272J | FK18C0G1H272J |
| C0G                         | 3300pF      | ±5%       | 50                   | FK28C0G1H332J | FK18C0G1H332J |
| C0G                         | 3900pF      | ±5%       | 50                   | FK28C0G1H392J | FK18C0G1H392J |
| C0G                         | 4700pF      | ±5%       | 50                   | FK28C0G1H472J | FK18C0G1H472J |
| C0G                         | 5600pF      | ±5%       | 50                   | FK28C0G1H562J | FK18C0G1H562J |
| C0G                         | 6800pF      | ±5%       | 50                   | FK28C0G1H682J | FK18C0G1H682J |
| C0G                         | 8200pF      | ±5%       | 50                   | FK28C0G1H822J | FK18C0G1H822J |
| C0G                         | 10000pF     | ±5%       | 50                   | FK28C0G1H103J | FK18C0G1H103J |

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## FK24 AND FK14 TYPES

### SHAPES AND DIMENSIONS



#### RATED VOLTAGE Edc: 50V

| Temperature characteristics | Capacitance | Tolerance | Rated voltage Edc(V) | Part No.      |               |
|-----------------------------|-------------|-----------|----------------------|---------------|---------------|
|                             |             |           |                      | FK24 type     | FK14 type     |
| C0G                         | 2700pF      | ±5%       | 50                   | FK24C0G1H272J | FK14C0G1H272J |
| C0G                         | 3300pF      | ±5%       | 50                   | FK24C0G1H332J | FK14C0G1H332J |
| C0G                         | 3900pF      | ±5%       | 50                   | FK24C0G1H392J | FK14C0G1H392J |
| C0G                         | 4700pF      | ±5%       | 50                   | FK24C0G1H472J | FK14C0G1H472J |
| C0G                         | 5600pF      | ±5%       | 50                   | FK24C0G1H562J | FK14C0G1H562J |
| C0G                         | 6800pF      | ±5%       | 50                   | FK24C0G1H682J | FK14C0G1H682J |
| C0G                         | 8200pF      | ±5%       | 50                   | FK24C0G1H822J | FK14C0G1H822J |
| C0G                         | 10000pF     | ±5%       | 50                   | FK24C0G1H103J | FK14C0G1H103J |
| C0G                         | 15000pF     | ±5%       | 50                   | FK24C0G1H153J | FK14C0G1H153J |
| C0G                         | 22000pF     | ±5%       | 50                   | FK24C0G1H223J | FK14C0G1H223J |
| C0G                         | 33000pF     | ±5%       | 50                   | FK24C0G1H333J | FK14C0G1H333J |

## FK26 AND FK16 TYPES

### SHAPES AND DIMENSIONS



#### RATED VOLTAGE Edc: 50V

| Temperature characteristics | Capacitance | Tolerance | Rated voltage Edc(V) | Part No.      |               |
|-----------------------------|-------------|-----------|----------------------|---------------|---------------|
|                             |             |           |                      | FK26 type     | FK16 type     |
| C0G                         | 4700pF      | ±5%       | 50                   | FK26C0G1H472J | FK16C0G1H472J |
| C0G                         | 5600pF      | ±5%       | 50                   | FK26C0G1H562J | FK16C0G1H562J |
| C0G                         | 6800pF      | ±5%       | 50                   | FK26C0G1H682J | FK16C0G1H682J |
| C0G                         | 8200pF      | ±5%       | 50                   | FK26C0G1H822J | FK16C0G1H822J |
| C0G                         | 10000pF     | ±5%       | 50                   | FK26C0G1H103J | FK16C0G1H103J |
| C0G                         | 15000pF     | ±5%       | 50                   | FK26C0G1H153J | FK16C0G1H153J |
| C0G                         | 22000pF     | ±5%       | 50                   | FK26C0G1H223J | FK16C0G1H223J |
| C0G                         | 33000pF     | ±5%       | 50                   | FK26C0G1H333J | FK16C0G1H333J |
| C0G                         | 47000pF     | ±5%       | 50                   | FK26C0G1H473J | FK16C0G1H473J |
| C0G                         | 68000pF     | ±5%       | 50                   | FK26C0G1H683J | FK16C0G1H683J |
| C0G                         | 0.1µF       | ±5%       | 50                   | FK26C0G1H104J | FK16C0G1H104J |

## FK20 AND FK11 TYPES

### SHAPES AND DIMENSIONS



Dimensions in mm

### RATED VOLTAGE Edc: 50V

| Temperature characteristics | Capacitance | Tolerance | Rated voltage Edc(V) | Part No.      |               |
|-----------------------------|-------------|-----------|----------------------|---------------|---------------|
|                             |             |           |                      | FK20 type     | FK11 type     |
| C0G                         | 22000pF     | ±5%       | 50                   | FK20C0G1H223J | FK11C0G1H223J |
| C0G                         | 33000pF     | ±5%       | 50                   | FK20C0G1H333J | FK11C0G1H333J |
| C0G                         | 47000pF     | ±5%       | 50                   | FK20C0G1H473J | FK11C0G1H473J |
| C0G                         | 68000pF     | ±5%       | 50                   | FK20C0G1H683J | FK11C0G1H683J |
| C0G                         | 0.1μF       | ±5%       | 50                   | FK20C0G1H104J | FK11C0G1H104J |

## FK22 TYPE

### SHAPES AND DIMENSIONS



Dimensions in mm

### RATED VOLTAGE Edc: 50V

| Temperature characteristics | Capacitance | Tolerance | Rated voltage Edc(V) | Part No.      |
|-----------------------------|-------------|-----------|----------------------|---------------|
|                             |             |           |                      | FK22 type     |
| C0G                         | 0.15μF      | ±5%       | 50                   | FK22C0G1H154J |
| C0G                         | 0.22μF      | ±5%       | 50                   | FK22C0G1H224J |

## CAPACITANCE RANGES: CLASS 2 (TEMPERATURE STABLE)

## FK28 AND FK18 TYPES

## SHAPES AND DIMENSIONS



## RATED VOLTAGE Edc: 6.3 to 50V

| Temperature characteristics | Capacitance | Tolerance | Rated voltage Edc(V) | Part No.      |               |
|-----------------------------|-------------|-----------|----------------------|---------------|---------------|
|                             |             |           |                      | FK28 type     | FK18 type     |
| X7R                         | 1000pF      | ±10%      | 50                   | FK28X7R1H102K | FK18X7R1H102K |
| X7R                         | 1500pF      | ±10%      | 50                   | FK28X7R1H152K | FK18X7R1H152K |
| X7R                         | 2200pF      | ±10%      | 50                   | FK28X7R1H222K | FK18X7R1H222K |
| X7R                         | 3300pF      | ±10%      | 50                   | FK28X7R1H332K | FK18X7R1H332K |
| X7R                         | 4700pF      | ±10%      | 50                   | FK28X7R1H472K | FK18X7R1H472K |
| X7R                         | 6800pF      | ±10%      | 50                   | FK28X7R1H682K | FK18X7R1H682K |
| X7R                         | 10000pF     | ±10%      | 50                   | FK28X7R1H103K | FK18X7R1H103K |
| X7R                         | 15000pF     | ±10%      | 50                   | FK28X7R1H153K | FK18X7R1H153K |
| X7R                         | 22000pF     | ±10%      | 50                   | FK28X7R1H223K | FK18X7R1H223K |
| X7R                         | 33000pF     | ±10%      | 50                   | FK28X7R1H333K | FK18X7R1H333K |
| X7R                         | 47000pF     | ±10%      | 50                   | FK28X7R1H473K | FK18X7R1H473K |
| X7R                         | 68000pF     | ±10%      | 50                   | FK28X7R1H683K | FK18X7R1H683K |
| X7R                         | 0.1μF       | ±10%      | 50                   | FK28X7R1H104K | FK18X7R1H104K |
| X7R                         | 0.15μF      | ±10%      | 50                   | FK28X7R1H154K | FK18X7R1H154K |
| X7R                         | 0.22μF      | ±10%      | 50                   | FK28X7R1H224K | FK18X7R1H224K |
| X7R                         | 0.1μF       | ±10%      | 25                   | FK28X7R1E104K | FK18X7R1E104K |
| X7R                         | 0.15μF      | ±10%      | 25                   | FK28X7R1E154K | FK18X7R1E154K |
| X7R                         | 0.22μF      | ±10%      | 25                   | FK28X7R1E224K | FK18X7R1E224K |
| X7R                         | 0.33μF      | ±10%      | 25                   | FK28X7R1E334K | FK18X7R1E334K |
| X7R                         | 0.47μF      | ±10%      | 25                   | FK28X7R1E474K | FK18X7R1E474K |
| X7R                         | 0.68μF      | ±10%      | 25                   | FK28X7R1E684K | FK18X7R1E684K |
| X7R                         | 1μF         | ±10%      | 25                   | FK28X7R1E105K | FK18X7R1E105K |
| X7R                         | 0.22μF      | ±10%      | 16                   | FK28X7R1C224K | FK18X7R1C224K |
| X7R                         | 0.33μF      | ±10%      | 16                   | FK28X7R1C334K | FK18X7R1C334K |
| X7R                         | 0.47μF      | ±10%      | 16                   | FK28X7R1C474K | FK18X7R1C474K |
| X7R                         | 0.68μF      | ±10%      | 16                   | FK28X7R1C684K | FK18X7R1C684K |
| X7R                         | 1μF         | ±10%      | 16                   | FK28X7R1C105K | FK18X7R1C105K |
| X7R                         | 1.5μF       | ±10%      | 6.3                  | FK28X7R0J155K | FK18X7R0J155K |
| X7R                         | 2.2μF       | ±10%      | 6.3                  | FK28X7R0J225K | FK18X7R0J225K |
| X5R                         | 0.22μF      | ±10%      | 25                   | FK28X5R1E224K | FK18X5R1E224K |
| X5R                         | 0.33μF      | ±10%      | 25                   | FK28X5R1E334K | FK18X5R1E334K |
| X5R                         | 0.47μF      | ±10%      | 25                   | FK28X5R1E474K | FK18X5R1E474K |
| X5R                         | 0.68μF      | ±10%      | 25                   | FK28X5R1E684K | FK18X5R1E684K |
| X5R                         | 1μF         | ±10%      | 25                   | FK28X5R1E105K | FK18X5R1E105K |
| X5R                         | 0.47μF      | ±10%      | 16                   | FK28X5R1C474K | FK18X5R1C474K |
| X5R                         | 0.68μF      | ±10%      | 16                   | FK28X5R1C684K | FK18X5R1C684K |
| X5R                         | 1μF         | ±10%      | 16                   | FK28X5R1C105K | FK18X5R1C105K |
| X5R                         | 1.5μF       | ±10%      | 16                   | FK28X5R1C155K | FK18X5R1C155K |
| X5R                         | 2.2μF       | ±10%      | 16                   | FK28X5R1C225K | FK18X5R1C225K |
| X5R                         | 0.33μF      | ±10%      | 10                   | FK28X5R1A334K | FK18X5R1A334K |
| X5R                         | 0.47μF      | ±10%      | 10                   | FK28X5R1A474K | FK18X5R1A474K |
| X5R                         | 0.68μF      | ±10%      | 10                   | FK28X5R1A684K | FK18X5R1A684K |
| X5R                         | 1μF         | ±10%      | 10                   | FK28X5R1A105K | FK18X5R1A105K |
| X5R                         | 1.5μF       | ±10%      | 10                   | FK28X5R1A155K | FK18X5R1A155K |
| X5R                         | 2.2μF       | ±10%      | 10                   | FK28X5R1A225K | FK18X5R1A225K |
| X5R                         | 3.3μF       | ±10%      | 10                   | FK28X5R1A335K | FK18X5R1A335K |
| X5R                         | 4.7μF       | ±10%      | 10                   | FK28X5R1A475K | FK18X5R1A475K |

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## CAPACITORS



RATED VOLTAGE Edc: 6.3 to 50V

| Temperature characteristics | Capacitance | Tolerance | Rated voltage Edc(V) | Part No.      |               |
|-----------------------------|-------------|-----------|----------------------|---------------|---------------|
|                             |             |           |                      | FK28 type     | FK18 type     |
| X5R                         | 1 $\mu$ F   | $\pm$ 10% | 6.3                  | FK28X5R0J105K | FK18X5R0J105K |
| X5R                         | 1.5 $\mu$ F | $\pm$ 10% | 6.3                  | FK28X5R0J155K | FK18X5R0J155K |
| X5R                         | 2.2 $\mu$ F | $\pm$ 10% | 6.3                  | FK28X5R0J225K | FK18X5R0J225K |
| X5R                         | 3.3 $\mu$ F | $\pm$ 10% | 6.3                  | FK28X5R0J335K | FK18X5R0J335K |
| X5R                         | 4.7 $\mu$ F | $\pm$ 10% | 6.3                  | FK28X5R0J475K | FK18X5R0J475K |
| X5R                         | 6.8 $\mu$ F | $\pm$ 10% | 6.3                  | FK28X5R0J685K | FK18X5R0J685K |
| X5R                         | 10 $\mu$ F  | $\pm$ 20% | 6.3                  | FK28X5R0J106M | FK18X5R0J106M |

**FK24 AND FK14 TYPES**  
**SHAPES AND DIMENSIONS**

**RATED VOLTAGE Edc: 6.3 to 50V**

| Temperature characteristics | Capacitance  | Tolerance  | Rated voltage Edc(V) | Part No.      |               |
|-----------------------------|--------------|------------|----------------------|---------------|---------------|
|                             |              |            |                      | FK24 type     | FK14 type     |
| X7R                         | 0.15 $\mu$ F | $\pm 10\%$ | 50                   | FK24X7R1H154K | FK14X7R1H154K |
| X7R                         | 0.22 $\mu$ F | $\pm 10\%$ | 50                   | FK24X7R1H224K | FK14X7R1H224K |
| X7R                         | 0.33 $\mu$ F | $\pm 10\%$ | 50                   | FK24X7R1H334K | FK14X7R1H334K |
| X7R                         | 0.47 $\mu$ F | $\pm 10\%$ | 50                   | FK24X7R1H474K | FK14X7R1H474K |
| X7R                         | 0.68 $\mu$ F | $\pm 10\%$ | 50                   | FK24X7R1H684K | FK14X7R1H684K |
| X7R                         | 1 $\mu$ F    | $\pm 10\%$ | 50                   | FK24X7R1H105K | FK14X7R1H105K |
| X7R                         | 0.47 $\mu$ F | $\pm 10\%$ | 25                   | FK24X7R1E474K | FK14X7R1E474K |
| X7R                         | 0.68 $\mu$ F | $\pm 10\%$ | 25                   | FK24X7R1E684K | FK14X7R1E684K |
| X7R                         | 1 $\mu$ F    | $\pm 10\%$ | 25                   | FK24X7R1E105K | FK14X7R1E105K |
| X7R                         | 1.5 $\mu$ F  | $\pm 10\%$ | 25                   | FK24X7R1E155K | FK14X7R1E155K |
| X7R                         | 2.2 $\mu$ F  | $\pm 10\%$ | 25                   | FK24X7R1E225K | FK14X7R1E225K |
| X7R                         | 3.3 $\mu$ F  | $\pm 10\%$ | 25                   | FK24X7R1E335K | FK14X7R1E335K |
| X7R                         | 4.7 $\mu$ F  | $\pm 10\%$ | 25                   | FK24X7R1E475K | FK14X7R1E475K |
| X7R                         | 0.68 $\mu$ F | $\pm 10\%$ | 16                   | FK24X7R1C684K | FK14X7R1C684K |
| X7R                         | 1 $\mu$ F    | $\pm 10\%$ | 16                   | FK24X7R1C105K | FK14X7R1C105K |
| X7R                         | 1.5 $\mu$ F  | $\pm 10\%$ | 16                   | FK24X7R1C155K | FK14X7R1C155K |
| X7R                         | 2.2 $\mu$ F  | $\pm 10\%$ | 16                   | FK24X7R1C225K | FK14X7R1C225K |
| X7R                         | 3.3 $\mu$ F  | $\pm 10\%$ | 16                   | FK24X7R1C335K | FK14X7R1C335K |
| X7R                         | 4.7 $\mu$ F  | $\pm 10\%$ | 16                   | FK24X7R1C475K | FK14X7R1C475K |
| X7R                         | 6.8 $\mu$ F  | $\pm 10\%$ | 6.3                  | FK24X7R0J685K | FK14X7R0J685K |
| X7R                         | 10 $\mu$ F   | $\pm 10\%$ | 6.3                  | FK24X7R0J106K | FK14X7R0J106K |
| X5R                         | 0.68 $\mu$ F | $\pm 10\%$ | 25                   | FK24X5R1E684K | FK14X5R1E684K |
| X5R                         | 1 $\mu$ F    | $\pm 10\%$ | 25                   | FK24X5R1E105K | FK14X5R1E105K |
| X5R                         | 1.5 $\mu$ F  | $\pm 10\%$ | 25                   | FK24X5R1E155K | FK14X5R1E155K |
| X5R                         | 2.2 $\mu$ F  | $\pm 10\%$ | 25                   | FK24X5R1E225K | FK14X5R1E225K |
| X5R                         | 3.3 $\mu$ F  | $\pm 10\%$ | 25                   | FK24X5R1E335K | FK14X5R1E335K |
| X5R                         | 4.7 $\mu$ F  | $\pm 10\%$ | 25                   | FK24X5R1E475K | FK14X5R1E475K |
| X5R                         | 1 $\mu$ F    | $\pm 10\%$ | 16                   | FK24X5R1C105K | FK14X5R1C105K |
| X5R                         | 1.5 $\mu$ F  | $\pm 10\%$ | 16                   | FK24X5R1C155K | FK14X5R1C155K |
| X5R                         | 2.2 $\mu$ F  | $\pm 10\%$ | 16                   | FK24X5R1C225K | FK14X5R1C225K |
| X5R                         | 3.3 $\mu$ F  | $\pm 10\%$ | 16                   | FK24X5R1C335K | FK14X5R1C335K |
| X5R                         | 4.7 $\mu$ F  | $\pm 10\%$ | 16                   | FK24X5R1C475K | FK14X5R1C475K |
| X5R                         | 10 $\mu$ F   | $\pm 10\%$ | 16                   | FK24X5R1C106K | FK14X5R1C106K |
| X5R                         | 1.5 $\mu$ F  | $\pm 10\%$ | 10                   | FK24X5R1A155K | FK14X5R1A155K |
| X5R                         | 2.2 $\mu$ F  | $\pm 10\%$ | 10                   | FK24X5R1A225K | FK14X5R1A225K |
| X5R                         | 3.3 $\mu$ F  | $\pm 10\%$ | 10                   | FK24X5R1A335K | FK14X5R1A335K |
| X5R                         | 4.7 $\mu$ F  | $\pm 10\%$ | 10                   | FK24X5R1A475K | FK14X5R1A475K |
| X5R                         | 6.8 $\mu$ F  | $\pm 10\%$ | 10                   | FK24X5R1A685K | FK14X5R1A685K |
| X5R                         | 10 $\mu$ F   | $\pm 10\%$ | 10                   | FK24X5R1A106K | FK14X5R1A106K |
| X5R                         | 4.7 $\mu$ F  | $\pm 10\%$ | 6.3                  | FK24X5R0J475K | FK14X5R0J475K |
| X5R                         | 6.8 $\mu$ F  | $\pm 10\%$ | 6.3                  | FK24X5R0J685K | FK14X5R0J685K |
| X5R                         | 10 $\mu$ F   | $\pm 10\%$ | 6.3                  | FK24X5R0J106K | FK14X5R0J106K |
| X5R                         | 15 $\mu$ F   | $\pm 20\%$ | 6.3                  | FK24X5R0J156M | FK14X5R0J156M |
| X5R                         | 22 $\mu$ F   | $\pm 20\%$ | 6.3                  | FK24X5R0J226M | FK14X5R0J226M |



**FK26 AND FK16 TYPES**  
**SHAPES AND DIMENSIONS**

**RATED VOLTAGE Edc: 6.3 to 50V**

| Temperature characteristics | Capacitance | Tolerance | Rated voltage Edc(V) | Part No.      |               |
|-----------------------------|-------------|-----------|----------------------|---------------|---------------|
|                             |             |           |                      | FK26 type     | FK16 type     |
| X7R                         | 0.47µF      | ±10%      | 50                   | FK26X7R1H474K | FK16X7R1H474K |
| X7R                         | 0.68µF      | ±10%      | 50                   | FK26X7R1H684K | FK16X7R1H684K |
| X7R                         | 1µF         | ±10%      | 50                   | FK26X7R1H105K | FK16X7R1H105K |
| X7R                         | 1.5µF       | ±10%      | 50                   | FK26X7R1H155K | FK16X7R1H155K |
| X7R                         | 2.2µF       | ±10%      | 50                   | FK26X7R1H225K | FK16X7R1H225K |
| X7R                         | 0.68µF      | ±10%      | 25                   | FK26X7R1E684K | FK16X7R1E684K |
| X7R                         | 1µF         | ±10%      | 25                   | FK26X7R1E105K | FK16X7R1E105K |
| X7R                         | 1.5µF       | ±10%      | 25                   | FK26X7R1E155K | FK16X7R1E155K |
| X7R                         | 2.2µF       | ±10%      | 25                   | FK26X7R1E225K | FK16X7R1E225K |
| X7R                         | 3.3µF       | ±10%      | 25                   | FK26X7R1E335K | FK16X7R1E335K |
| X7R                         | 4.7µF       | ±10%      | 25                   | FK26X7R1E475K | FK16X7R1E475K |
| X7R                         | 6.8µF       | ±10%      | 25                   | FK26X7R1E685K | FK16X7R1E685K |
| X7R                         | 10µF        | ±10%      | 25                   | FK26X7R1E106K | FK16X7R1E106K |
| X7R                         | 3.3µF       | ±10%      | 16                   | FK26X7R1C335K | FK16X7R1C335K |
| X7R                         | 4.7µF       | ±10%      | 16                   | FK26X7R1C475K | FK16X7R1C475K |
| X7R                         | 6.8µF       | ±10%      | 16                   | FK26X7R1C685K | FK16X7R1C685K |
| X7R                         | 10µF        | ±10%      | 16                   | FK26X7R1C106K | FK16X7R1C106K |
| X5R                         | 1µF         | ±10%      | 50                   | FK26X5R1H105K | FK16X5R1H105K |
| X5R                         | 1.5µF       | ±10%      | 25                   | FK26X5R1E155K | FK16X5R1E155K |
| X5R                         | 2.2µF       | ±10%      | 25                   | FK26X5R1E225K | FK16X5R1E225K |
| X5R                         | 3.3µF       | ±10%      | 25                   | FK26X5R1E335K | FK16X5R1E335K |
| X5R                         | 4.7µF       | ±10%      | 25                   | FK26X5R1E475K | FK16X5R1E475K |
| X5R                         | 3.3µF       | ±10%      | 16                   | FK26X5R1C335K | FK16X5R1C335K |
| X5R                         | 4.7µF       | ±10%      | 16                   | FK26X5R1C475K | FK16X5R1C475K |
| X5R                         | 6.8µF       | ±10%      | 16                   | FK26X5R1C685K | FK16X5R1C685K |
| X5R                         | 10µF        | ±10%      | 16                   | FK26X5R1C106K | FK16X5R1C106K |
| X5R                         | 6.8µF       | ±10%      | 10                   | FK26X5R1A685K | FK16X5R1A685K |
| X5R                         | 10µF        | ±10%      | 10                   | FK26X5R1A106K | FK16X5R1A106K |
| X5R                         | 6.8µF       | ±10%      | 6.3                  | FK26X5R0J685K | FK16X5R0J685K |
| X5R                         | 10µF        | ±10%      | 6.3                  | FK26X5R0J106K | FK16X5R0J106K |
| X5R                         | 15µF        | ±20%      | 6.3                  | FK26X5R0J156M | FK16X5R0J156M |
| X5R                         | 22µF        | ±20%      | 6.3                  | FK26X5R0J226M | FK16X5R0J226M |
| X5R                         | 33µF        | ±20%      | 6.3                  | FK26X5R0J336M | FK16X5R0J336M |
| X5R                         | 47µF        | ±20%      | 6.3                  | FK26X5R0J476M | FK16X5R0J476M |

**FK20 AND FK11 TYPES**  
**SHAPES AND DIMENSIONS**

**RATED VOLTAGE E<sub>dc</sub>: 6.3 to 50V**

| Temperature characteristics | Capacitance | Tolerance | Rated voltage E <sub>dc</sub> (V) | Part No.      |               |
|-----------------------------|-------------|-----------|-----------------------------------|---------------|---------------|
|                             |             |           |                                   | FK20 type     | FK11 type     |
| X7R                         | 0.68μF      | ±10%      | 50                                | FK20X7R1H684K | FK11X7R1H684K |
| X7R                         | 1μF         | ±10%      | 50                                | FK20X7R1H105K | FK11X7R1H105K |
| X7R                         | 1.5μF       | ±10%      | 50                                | FK20X7R1H155K | FK11X7R1H155K |
| X7R                         | 2.2μF       | ±10%      | 50                                | FK20X7R1H225K | FK11X7R1H225K |
| X7R                         | 3.3μF       | ±10%      | 50                                | FK20X7R1H335K | FK11X7R1H335K |
| X7R                         | 4.7μF       | ±10%      | 50                                | FK20X7R1H475K | FK11X7R1H475K |
| X7R                         | 2.2μF       | ±10%      | 25                                | FK20X7R1E225K | FK11X7R1E225K |
| X7R                         | 3.3μF       | ±10%      | 25                                | FK20X7R1E335K | FK11X7R1E335K |
| X7R                         | 4.7μF       | ±10%      | 25                                | FK20X7R1E475K | FK11X7R1E475K |
| X7R                         | 6.8μF       | ±10%      | 25                                | FK20X7R1E685K | FK11X7R1E685K |
| X7R                         | 10μF        | ±10%      | 25                                | FK20X7R1E106K | FK11X7R1E106K |
| X7R                         | 10μF        | ±10%      | 16                                | FK20X7R1C106K | FK11X7R1C106K |
| X7R                         | 15μF        | ±20%      | 16                                | FK20X7R1C156M | FK11X7R1C156M |
| X7R                         | 22μF        | ±20%      | 16                                | FK20X7R1C226M | FK11X7R1C226M |
| X7R                         | 22μF        | ±20%      | 10                                | FK20X7R1A226M | FK11X7R1A226M |
| X5R                         | 2.2μF       | ±10%      | 50                                | FK20X5R1H225K | FK11X5R1H225K |
| X5R                         | 3.3μF       | ±10%      | 50                                | FK20X5R1H335K | FK11X5R1H335K |
| X5R                         | 4.7μF       | ±10%      | 25                                | FK20X5R1E475K | FK11X5R1E475K |
| X5R                         | 6.8μF       | ±10%      | 25                                | FK20X5R1E685K | FK11X5R1E685K |
| X5R                         | 10μF        | ±10%      | 25                                | FK20X5R1E106K | FK11X5R1E106K |
| X5R                         | 10μF        | ±10%      | 16                                | FK20X5R1C106K | FK11X5R1C106K |
| X5R                         | 15μF        | ±20%      | 16                                | FK20X5R1C156M | FK11X5R1C156M |
| X5R                         | 22μF        | ±20%      | 16                                | FK20X5R1C226M | FK11X5R1C226M |
| X5R                         | 15μF        | ±20%      | 10                                | FK20X5R1A156M | FK11X5R1A156M |
| X5R                         | 22μF        | ±20%      | 10                                | FK20X5R1A226M | FK11X5R1A226M |
| X5R                         | 22μF        | ±20%      | 6.3                               | FK20X5R0J226M | FK11X5R0J226M |
| X5R                         | 33μF        | ±20%      | 6.3                               | FK20X5R0J336M | FK11X5R0J336M |
| X5R                         | 47μF        | ±20%      | 6.3                               | FK20X5R0J476M | FK11X5R0J476M |
| X5R                         | 68μF        | ±20%      | 6.3                               | FK20X5R0J686M | FK11X5R0J686M |
| X5R                         | 100μF       | ±20%      | 6.3                               | FK20X5R0J107M | FK11X5R0J107M |
| X7S                         | 4.7μF       | ±10%      | 50                                | FK20X7S1H475K | FK11X7S1H475K |
| X7S                         | 6.8μF       | ±10%      | 50                                | FK20X7S1H685K | FK11X7S1H685K |
| X7S                         | 10μF        | ±10%      | 50                                | FK20X7S1H106K | FK11X7S1H106K |

## FK22 TYPE

## SHAPES AND DIMENSIONS



## RATED VOLTAGE Edc: 6.3 to 50V

| Temperature characteristics | Capacitance (pF) | Tolerance | Rated voltage Edc(V) | Part No.<br>FK22 type |
|-----------------------------|------------------|-----------|----------------------|-----------------------|
| X7R                         | 1.5μF            | ±10%      | 50                   | FK22X7R1H155K         |
| X7R                         | 2.2μF            | ±10%      | 50                   | FK22X7R1H225K         |
| X7R                         | 3.3μF            | ±10%      | 50                   | FK22X7R1H335K         |
| X7R                         | 4.7μF            | ±10%      | 50                   | FK22X7R1H475K         |
| X7R                         | 6.8μF            | ±10%      | 50                   | FK22X7R1H685K         |
| X7R                         | 4.7μF            | ±10%      | 25                   | FK22X7R1E475K         |
| X7R                         | 6.8μF            | ±10%      | 25                   | FK22X7R1E685K         |
| X7R                         | 10μF             | ±10%      | 25                   | FK22X7R1E106K         |
| X7R                         | 15μF             | ±20%      | 25                   | FK22X7R1E156M         |
| X7R                         | 22μF             | ±20%      | 25                   | FK22X7R1E226M         |
| X7R                         | 15μF             | ±20%      | 16                   | FK22X7R1C156M         |
| X7R                         | 22μF             | ±20%      | 16                   | FK22X7R1C226M         |
| X7R                         | 33μF             | ±20%      | 16                   | FK22X7R1C336M         |
| X5R                         | 4.7μF            | ±10%      | 50                   | FK22X5R1H475K         |
| X5R                         | 6.8μF            | ±10%      | 50                   | FK22X5R1H685K         |
| X5R                         | 15μF             | ±20%      | 25                   | FK22X5R1E156M         |
| X5R                         | 22μF             | ±20%      | 25                   | FK22X5R1E226M         |
| X5R                         | 33μF             | ±20%      | 16                   | FK22X5R1C336M         |
| X5R                         | 33μF             | ±20%      | 10                   | FK22X5R1A336M         |
| X5R                         | 47μF             | ±20%      | 10                   | FK22X5R1A476M         |
| X5R                         | 68μF             | ±20%      | 6.3                  | FK22X5R0J686M         |
| X5R                         | 100μF            | ±20%      | 6.3                  | FK22X5R0J107M         |

- For more information about products with other capacitance or other data, please contact us.

 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.

## PACKAGING STYLES

## TAPING DIMENSIONS

## FK1 Series

(FK18, FK14, FK16, FK11 Types)



| Symbol                       | Dimensions (mm) |
|------------------------------|-----------------|
| P                            | 12.7±1.0        |
| P <sub>0</sub> <sup>*1</sup> | 12.7±0.3        |
| P <sub>1</sub>               | 5.1±0.7         |
| P <sub>2</sub>               | 6.35±1.3        |
| W <sub>0</sub>               | 12.0±1.0        |
| W <sub>1</sub>               | 9.0±0.5         |
| W <sub>2</sub> <sup>*2</sup> | 3.0max.         |
| W <sub>3</sub>               | 18.0+1.0, -0.5  |
| H <sub>0</sub>               | 16.0±0.5        |
| ℓ                            | 1.0max.         |
| t                            | 0.6±0.2         |
| L <sub>0</sub> <sup>*3</sup> | 11.0max.        |
| F                            | 2.5+0.5, -0.2   |
| 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.

## FK2 Series

(FK28, FK24, FK26, FK20, FK22 Types)



| Symbol                       | Dimensions (mm) |
|------------------------------|-----------------|
| P                            | 12.7±1.0        |
| P <sub>0</sub> <sup>*1</sup> | 12.7±0.3        |
| P <sub>1</sub>               | 3.85±0.7        |
| P <sub>2</sub>               | 6.35±1.3        |
| W <sub>0</sub>               | 12.0±1.0        |
| W <sub>1</sub>               | 9.0±0.5         |
| W <sub>2</sub> <sup>*2</sup> | 3.0max.         |
| W <sub>3</sub>               | 18.0+1.0, -0.5  |
| H <sub>0</sub>               | 16.0±0.5        |
| ℓ                            | 1.0max.         |
| t                            | 0.6±0.2         |
| L <sub>0</sub> <sup>*3</sup> | 11.0max.        |
| F                            | 5.0+0.8, -0.2   |
| 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.

## PACKAGING QUANTITIES

| Type       | Quantity         |
|------------|------------------|
| FK28, FK18 | 2000 pieces/1box |
| FK24, FK14 |                  |
| FK26, FK16 |                  |
| FK20, FK11 | 1500 pieces/1box |
| FK22       |                  |

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.

# Capacitor with Multi-layer Lead

## Commercial Grade

Product compatible with RoHS directive

## Overview of the FK Mid Voltage (100 to 630V) Series

### FEATURES

- The capacitors adopts the unique structure designed by TDK for high voltage applications, realizing a high withstand voltage despite being small in size.
- Rated voltage Edc: 100, 200, and 630V.
- The leads are formed with a "kink" to achieve consistent insertion heights and facilitate the release of gases during soldering for dramatically improved solderability.
- Taping specifications are available for automatic insertions, which contribute to reduce on-board costs.

### PRODUCT IDENTIFICATION

FK 28 X7R 2A 102 K □□□□  
 (1) (2) (3) (4) (5) (6) (7)

(1) Series name

(2) Dimensions and shapes of lead wire



Dimensions in mm

| Type | L max. | W max. | T max. | F       | ø      | ød            | Fig |
|------|--------|--------|--------|---------|--------|---------------|-----|
| 28   | 4.0    | 5.5    | 2.5    | 5.0±1.0 | 7±2    | 0.5+0.1,-0.03 | 1   |
| 24   | 4.5    | 5.5    | 2.5    | 5.0±1.0 | 7±2    | 0.5+0.1,-0.03 | 1   |
| 26   | 5.5    | 6.0    | 3.5    | 5.0±1.0 | 7±2    | 0.5+0.1,-0.03 | 1   |
| 20   | 5.5    | 7.0    | 4.0    | 5.0±1.0 | 7±2    | 0.5+0.1,-0.03 | 1   |
| 22   | 7.5    | 8.0    | 4.0    | 5.0±1.0 | 7±2    | 0.5+0.1,-0.03 | 1   |
| 18   | 4.0    | 5.5    | 2.5    | 2.5±0.8 | 5+3,-1 | 0.5+0.1,-0.03 | 2   |
| 14   | 4.5    | 5.5    | 2.5    | 2.5±0.8 | 5+3,-1 | 0.5+0.1,-0.03 | 2   |
| 16   | 5.5    | 6.0    | 3.5    | 2.5±0.8 | 5+3,-1 | 0.5+0.1,-0.03 | 2   |
| 11   | 5.5    | 7.0    | 4.0    | 2.5±0.8 | 5+3,-1 | 0.5+0.1,-0.03 | 2   |

(3) Capacitance temperature characteristics

Class 1 (Temperature compensation)

| Temperature characteristics | Capacitance change | Temperature range |
|-----------------------------|--------------------|-------------------|
| C0G                         | 0±30ppm/°C         | -55 to +125°C     |

Class 2 (Temperature stable and general purpose)

| Temperature characteristics | Capacitance change | Temperature range |
|-----------------------------|--------------------|-------------------|
| X7R                         | ±15%               | -55 to +125°C     |
| X7S                         | ±22%               | -55 to +125°C     |

(4) Rated voltage Edc

|    |      |
|----|------|
| 2A | 100V |
| 2E | 250V |
| 2J | 630V |

(5) Nominal capacitance

The capacitance is expressed in three digit codes and in units of pico farads (pF).

The first and second digits identify the first and second significant figures of the capacitance.

The third digit identifies the multiplier.

|     |           |
|-----|-----------|
| 102 | 1,000pF   |
| 333 | 33,000pF  |
| 474 | 470,000pF |

(6) Capacitance tolerance

| Symbol | Tolerance |
|--------|-----------|
| J      | ±5%       |
| K      | ±10%      |

(7) TDK internal code

## CAPACITANCE RANGES: CLASS 1 (TEMPERATURE COMPENSATION)

## FK28 AND FK18 TYPES

## SHAPES AND DIMENSIONS

RATED VOLTAGE E<sub>dc</sub>: 100 to 250V

| Temperature characteristics | Capacitance | Tolerance | Rated voltage E <sub>dc</sub> (V) | Part No.      |               |
|-----------------------------|-------------|-----------|-----------------------------------|---------------|---------------|
|                             |             |           |                                   | FK28 type     | FK18 type     |
| C0G                         | 100pF       | ±5%       | 100                               | FK28C0G2A101J | FK18C0G2A101J |
| C0G                         | 120pF       | ±5%       | 100                               | FK28C0G2A121J | FK18C0G2A121J |
| C0G                         | 150pF       | ±5%       | 100                               | FK28C0G2A151J | FK18C0G2A151J |
| C0G                         | 180pF       | ±5%       | 100                               | FK28C0G2A181J | FK18C0G2A181J |
| C0G                         | 220pF       | ±5%       | 100                               | FK28C0G2A221J | FK18C0G2A221J |
| C0G                         | 270pF       | ±5%       | 100                               | FK28C0G2A271J | FK18C0G2A271J |
| C0G                         | 330pF       | ±5%       | 100                               | FK28C0G2A331J | FK18C0G2A331J |
| C0G                         | 390pF       | ±5%       | 100                               | FK28C0G2A391J | FK18C0G2A391J |
| C0G                         | 470pF       | ±5%       | 100                               | FK28C0G2A471J | FK18C0G2A471J |
| C0G                         | 560pF       | ±5%       | 100                               | FK28C0G2A561J | FK18C0G2A561J |
| C0G                         | 680pF       | ±5%       | 100                               | FK28C0G2A681J | FK18C0G2A681J |
| C0G                         | 820pF       | ±5%       | 100                               | FK28C0G2A821J | FK18C0G2A821J |
| C0G                         | 1000pF      | ±5%       | 100                               | FK28C0G2A102J | FK18C0G2A102J |
| C0G                         | 1200pF      | ±5%       | 100                               | FK28C0G2A122J | FK18C0G2A122J |
| C0G                         | 100pF       | ±5%       | 250                               | FK28C0G2E101J | FK18C0G2E101J |
| C0G                         | 120pF       | ±5%       | 250                               | FK28C0G2E121J | FK18C0G2E121J |
| C0G                         | 150pF       | ±5%       | 250                               | FK28C0G2E151J | FK18C0G2E151J |
| C0G                         | 180pF       | ±5%       | 250                               | FK28C0G2E181J | FK18C0G2E181J |
| C0G                         | 220pF       | ±5%       | 250                               | FK28C0G2E221J | FK18C0G2E221J |
| C0G                         | 270pF       | ±5%       | 250                               | FK28C0G2E271J | FK18C0G2E271J |
| C0G                         | 330pF       | ±5%       | 250                               | FK28C0G2E331J | FK18C0G2E331J |
| C0G                         | 390pF       | ±5%       | 250                               | FK28C0G2E391J | FK18C0G2E391J |
| C0G                         | 470pF       | ±5%       | 250                               | FK28C0G2E471J | FK18C0G2E471J |
| C0G                         | 560pF       | ±5%       | 250                               | FK28C0G2E561J | FK18C0G2E561J |
| C0G                         | 680pF       | ±5%       | 250                               | FK28C0G2E681J | FK18C0G2E681J |

## FK24 AND FK14 TYPES

### SHAPES AND DIMENSIONS



Dimensions in mm

### RATED VOLTAGE Edc: 100 to 250V

| Temperature characteristics | Capacitance | Tolerance | Rated voltage Edc(V) | Part No.      |               |
|-----------------------------|-------------|-----------|----------------------|---------------|---------------|
|                             |             |           |                      | FK24 type     | FK14 type     |
| C0G                         | 1000pF      | ±5%       | 100                  | FK24C0G2A102J | FK14C0G2A102J |
| C0G                         | 1200pF      | ±5%       | 100                  | FK24C0G2A122J | FK14C0G2A122J |
| C0G                         | 1500pF      | ±5%       | 100                  | FK24C0G2A152J | FK14C0G2A152J |
| C0G                         | 1800pF      | ±5%       | 100                  | FK24C0G2A182J | FK14C0G2A182J |
| C0G                         | 2200pF      | ±5%       | 100                  | FK24C0G2A222J | FK14C0G2A222J |
| C0G                         | 2700pF      | ±5%       | 100                  | FK24C0G2A272J | FK14C0G2A272J |
| C0G                         | 3300pF      | ±5%       | 100                  | FK24C0G2A332J | FK14C0G2A332J |
| C0G                         | 3900pF      | ±5%       | 100                  | FK24C0G2A392J | FK14C0G2A392J |
| C0G                         | 4700pF      | ±5%       | 100                  | FK24C0G2A472J | FK14C0G2A472J |
| C0G                         | 820pF       | ±5%       | 250                  | FK24C0G2E821J | FK14C0G2E821J |
| C0G                         | 1000pF      | ±5%       | 250                  | FK24C0G2E102J | FK14C0G2E102J |
| C0G                         | 1200pF      | ±5%       | 250                  | FK24C0G2E122J | FK14C0G2E122J |
| C0G                         | 1500pF      | ±5%       | 250                  | FK24C0G2E152J | FK14C0G2E152J |
| C0G                         | 1800pF      | ±5%       | 250                  | FK24C0G2E182J | FK14C0G2E182J |
| C0G                         | 2200pF      | ±5%       | 250                  | FK24C0G2E222J | FK14C0G2E222J |
| C0G                         | 2700pF      | ±5%       | 250                  | FK24C0G2E272J | FK14C0G2E272J |

**FK26 AND FK16 TYPES**  
**SHAPES AND DIMENSIONS**

**RATED VOLTAGE E<sub>dc</sub>: 100 to 630V**

| Temperature characteristics | Capacitance | Tolerance | Rated voltage E <sub>dc</sub> (V) | Part No.      |               |
|-----------------------------|-------------|-----------|-----------------------------------|---------------|---------------|
|                             |             |           |                                   | FK26 type     | FK16 type     |
| C0G                         | 3900pF      | ±5%       | 100                               | FK26C0G2A392J | FK16C0G2A392J |
| C0G                         | 4700pF      | ±5%       | 100                               | FK26C0G2A472J | FK16C0G2A472J |
| C0G                         | 5600pF      | ±5%       | 100                               | FK26C0G2A562J | FK16C0G2A562J |
| C0G                         | 6800pF      | ±5%       | 100                               | FK26C0G2A682J | FK16C0G2A682J |
| C0G                         | 8200pF      | ±5%       | 100                               | FK26C0G2A822J | FK16C0G2A822J |
| C0G                         | 10000pF     | ±5%       | 100                               | FK26C0G2A103J | FK16C0G2A103J |
| C0G                         | 3300pF      | ±5%       | 250                               | FK26C0G2E332J |               |
| C0G                         | 3900pF      | ±5%       | 250                               | FK26C0G2E392J |               |
| C0G                         | 4700pF      | ±5%       | 250                               | FK26C0G2E472J |               |
| C0G                         | 5600pF      | ±5%       | 250                               | FK26C0G2E562J |               |
| C0G                         | 6800pF      | ±5%       | 250                               | FK26C0G2E682J |               |
| C0G                         | 8200pF      | ±5%       | 250                               | FK26C0G2E822J |               |
| C0G                         | 100pF       | ±5%       | 630                               | FK26C0G2J101J |               |
| C0G                         | 120pF       | ±5%       | 630                               | FK26C0G2J121J |               |
| C0G                         | 150pF       | ±5%       | 630                               | FK26C0G2J151J |               |
| C0G                         | 180pF       | ±5%       | 630                               | FK26C0G2J181J |               |
| C0G                         | 220pF       | ±5%       | 630                               | FK26C0G2J221J |               |
| C0G                         | 270pF       | ±5%       | 630                               | FK26C0G2J271J |               |
| C0G                         | 330pF       | ±5%       | 630                               | FK26C0G2J331J |               |
| C0G                         | 390pF       | ±5%       | 630                               | FK26C0G2J391J |               |
| C0G                         | 470pF       | ±5%       | 630                               | FK26C0G2J471J |               |
| C0G                         | 560pF       | ±5%       | 630                               | FK26C0G2J561J |               |
| C0G                         | 680pF       | ±5%       | 630                               | FK26C0G2J681J |               |
| C0G                         | 820pF       | ±5%       | 630                               | FK26C0G2J821J |               |
| C0G                         | 1000pF      | ±5%       | 630                               | FK26C0G2J102J |               |
| C0G                         | 1200pF      | ±5%       | 630                               | FK26C0G2J122J |               |
| C0G                         | 1500pF      | ±5%       | 630                               | FK26C0G2J152J |               |
| C0G                         | 1800pF      | ±5%       | 630                               | FK26C0G2J182J |               |
| C0G                         | 2200pF      | ±5%       | 630                               | FK26C0G2J222J |               |
| C0G                         | 2700pF      | ±5%       | 630                               | FK26C0G2J272J |               |
| C0G                         | 3300pF      | ±5%       | 630                               | FK26C0G2J332J |               |



## FK20 AND FK11 TYPES

### SHAPES AND DIMENSIONS



### RATED VOLTAGE Edc: 100 to 630V

| Temperature characteristics | Capacitance | Tolerance | Rated voltage Edc(V) | Part No.      |               |
|-----------------------------|-------------|-----------|----------------------|---------------|---------------|
|                             |             |           |                      | FK20 type     | FK11 type     |
| C0G                         | 1500pF      | ±5%       | 100                  | FK20C0G2A153J | FK11C0G2A153J |
| C0G                         | 2200pF      | ±5%       | 100                  | FK20C0G2A223J | FK11C0G2A223J |
| C0G                         | 3300pF      | ±5%       | 100                  | FK20C0G2A333J | FK11C0G2A333J |
| C0G                         | 4700pF      | ±5%       | 100                  | FK20C0G2A473J | FK11C0G2A473J |
| C0G                         | 1000pF      | ±5%       | 250                  | FK20C0G2E103J |               |
| C0G                         | 1500pF      | ±5%       | 250                  | FK20C0G2E153J |               |
| C0G                         | 390pF       | ±5%       | 630                  | FK20C0G2J392J |               |
| C0G                         | 470pF       | ±5%       | 630                  | FK20C0G2J472J |               |
| C0G                         | 560pF       | ±5%       | 630                  | FK20C0G2J562J |               |
| C0G                         | 680pF       | ±5%       | 630                  | FK20C0G2J682J |               |

## FK22 TYPE

### SHAPES AND DIMENSIONS



### RATED VOLTAGE Edc: 100 to 630V

| Temperature characteristics | Capacitance | Tolerance | Rated voltage Edc(V) | Part No.      |
|-----------------------------|-------------|-----------|----------------------|---------------|
|                             |             |           |                      | FK22 type     |
| C0G                         | 6800pF      | ±5%       | 100                  | FK22C0G2A683J |
| C0G                         | 0.1μF       | ±5%       | 100                  | FK22C0G2A104J |
| C0G                         | 2200pF      | ±5%       | 250                  | FK22C0G2E223J |
| C0G                         | 3300pF      | ±5%       | 250                  | FK22C0G2E333J |
| C0G                         | 4700pF      | ±5%       | 250                  | FK22C0G2E473J |
| C0G                         | 820pF       | ±5%       | 630                  | FK22C0G2J822J |
| C0G                         | 1000pF      | ±5%       | 630                  | FK22C0G2J103J |
| C0G                         | 1500pF      | ±5%       | 630                  | FK22C0G2J153J |
| C0G                         | 2200pF      | ±5%       | 630                  | FK22C0G2J223J |

## CAPACITANCE RANGES: CLASS 2 (TEMPERATURE STABLE)

## FK28 AND FK18 TYPES

## SHAPES AND DIMENSIONS

RATED VOLTAGE E<sub>dc</sub>: 100 to 250V

| Temperature characteristics | Capacitance | Tolerance | Rated voltage E <sub>dc</sub> (V) | Part No.      |               |
|-----------------------------|-------------|-----------|-----------------------------------|---------------|---------------|
|                             |             |           |                                   | FK28 type     | FK18 type     |
| X7R                         | 1000pF      | ±10%      | 100                               | FK28X7R2A102K | FK18X7R2A102K |
| X7R                         | 1500pF      | ±10%      | 100                               | FK28X7R2A152K | FK18X7R2A152K |
| X7R                         | 2200pF      | ±10%      | 100                               | FK28X7R2A222K | FK18X7R2A222K |
| X7R                         | 3300pF      | ±10%      | 100                               | FK28X7R2A332K | FK18X7R2A332K |
| X7R                         | 4700pF      | ±10%      | 100                               | FK28X7R2A472K | FK18X7R2A472K |
| X7R                         | 6800pF      | ±10%      | 100                               | FK28X7R2A682K | FK18X7R2A682K |
| X7R                         | 10000pF     | ±10%      | 100                               | FK28X7R2A103K | FK18X7R2A103K |
| X7R                         | 15000pF     | ±10%      | 100                               | FK28X7R2A153K | FK18X7R2A153K |
| X7R                         | 22000pF     | ±10%      | 100                               | FK28X7R2A223K | FK18X7R2A223K |
| X7S                         | 33000pF     | ±10%      | 100                               | FK28X7S2A333K | FK18X7S2A333K |
| X7S                         | 47000pF     | ±10%      | 100                               | FK28X7S2A473K | FK18X7S2A473K |
| X7S                         | 68000pF     | ±10%      | 100                               | FK28X7S2A683K | FK18X7S2A683K |
| X7S                         | 0.1μF       | ±10%      | 100                               | FK28X7S2A104K | FK18X7S2A104K |

**FK24 AND FK14 TYPES**  
**SHAPES AND DIMENSIONS**

**RATED VOLTAGE Edc: 100 to 250V**

| Temperature characteristics | Capacitance | Tolerance | Rated voltage Edc(V) | Part No.      |               |
|-----------------------------|-------------|-----------|----------------------|---------------|---------------|
|                             |             |           |                      | FK24 type     | FK14 type     |
| X7R                         | 1000pF      | ±10%      | 100                  | FK24X7R2A102K | FK14X7R2A102K |
| X7R                         | 1500pF      | ±10%      | 100                  | FK24X7R2A152K | FK14X7R2A152K |
| X7R                         | 2200pF      | ±10%      | 100                  | FK24X7R2A222K | FK14X7R2A222K |
| X7R                         | 3300pF      | ±10%      | 100                  | FK24X7R2A332K | FK14X7R2A332K |
| X7R                         | 4700pF      | ±10%      | 100                  | FK24X7R2A472K | FK14X7R2A472K |
| X7R                         | 6800pF      | ±10%      | 100                  | FK24X7R2A682K | FK14X7R2A682K |
| X7R                         | 10000pF     | ±10%      | 100                  | FK24X7R2A103K | FK14X7R2A103K |
| X7R                         | 15000pF     | ±10%      | 100                  | FK24X7R2A153K | FK14X7R2A153K |
| X7R                         | 22000pF     | ±10%      | 100                  | FK24X7R2A223K | FK14X7R2A223K |
| X7R                         | 33000pF     | ±10%      | 100                  | FK24X7R2A333K | FK14X7R2A333K |
| X7R                         | 47000pF     | ±10%      | 100                  | FK24X7R2A473K | FK14X7R2A473K |
| X7R                         | 68000pF     | ±10%      | 100                  | FK24X7R2A683K | FK14X7R2A683K |
| X7R                         | 0.1μF       | ±10%      | 100                  | FK24X7R2A104K | FK14X7R2A104K |
| X7S                         | 0.15μF      | ±10%      | 100                  | FK24X7S2A154K | FK14X7S2A154K |
| X7S                         | 0.22μF      | ±10%      | 100                  | FK24X7S2A224K | FK14X7S2A224K |
| X7S                         | 0.33μF      | ±10%      | 100                  | FK24X7S2A334K | FK14X7S2A334K |
| X7S                         | 0.47μF      | ±10%      | 100                  | FK24X7S2A474K | FK14X7S2A474K |
| X7S                         | 0.68μF      | ±10%      | 100                  | FK24X7S2A684K | FK14X7S2A684K |
| X7S                         | 1μF         | ±10%      | 100                  | FK24X7S2A105K | FK14X7S2A105K |
| X7R                         | 1000pF      | ±10%      | 250                  | FK24X7R2E102K | FK14X7R2E102K |
| X7R                         | 1500pF      | ±10%      | 250                  | FK24X7R2E152K | FK14X7R2E152K |
| X7R                         | 2200pF      | ±10%      | 250                  | FK24X7R2E222K | FK14X7R2E222K |
| X7R                         | 3300pF      | ±10%      | 250                  | FK24X7R2E332K | FK14X7R2E332K |
| X7R                         | 4700pF      | ±10%      | 250                  | FK24X7R2E472K | FK14X7R2E472K |
| X7R                         | 6800pF      | ±10%      | 250                  | FK24X7R2E682K | FK14X7R2E682K |
| X7R                         | 10000pF     | ±10%      | 250                  | FK24X7R2E103K | FK14X7R2E103K |
| X7R                         | 15000pF     | ±10%      | 250                  | FK24X7R2E153K | FK14X7R2E153K |
| X7R                         | 22000pF     | ±10%      | 250                  | FK24X7R2E223K | FK14X7R2E223K |

## FK26 AND FK16 TYPES

### SHAPES AND DIMENSIONS



### RATED VOLTAGE Edc: 100 to 630V

| Temperature characteristics | Capacitance | Tolerance | Rated voltage Edc(V) | Part No.      |               |
|-----------------------------|-------------|-----------|----------------------|---------------|---------------|
|                             |             |           |                      | FK26 type     | FK16 type     |
| X7R                         | 33000pF     | ±10%      | 100                  | FK26X7R2A333K | FK16X7R2A333K |
| X7R                         | 47000pF     | ±10%      | 100                  | FK26X7R2A473K | FK16X7R2A473K |
| X7R                         | 68000pF     | ±10%      | 100                  | FK26X7R2A683K | FK16X7R2A683K |
| X7R                         | 0.1μF       | ±10%      | 100                  | FK26X7R2A104K | FK16X7R2A104K |
| X7R                         | 0.15μF      | ±10%      | 100                  | FK26X7R2A154K | FK16X7R2A154K |
| X7R                         | 0.22μF      | ±10%      | 100                  | FK26X7R2A224K | FK16X7R2A224K |
| X7R                         | 0.33μF      | ±10%      | 100                  | FK26X7R2A334K | FK16X7R2A334K |
| X7R                         | 0.47μF      | ±10%      | 100                  | FK26X7R2A474K | FK16X7R2A474K |
| X7R                         | 0.68μF      | ±10%      | 100                  | FK26X7R2A684K | FK16X7R2A684K |
| X7R                         | 1μF         | ±10%      | 100                  | FK26X7R2A105K | FK16X7R2A105K |
| X7S                         | 1.5μF       | ±10%      | 100                  | FK26X7S2A155K | FK16X7S2A155K |
| X7S                         | 2.2μF       | ±10%      | 100                  | FK26X7S2A225K | FK16X7S2A225K |
| X7R                         | 15000pF     | ±10%      | 250                  | FK26X7R2E153K |               |
| X7R                         | 22000pF     | ±10%      | 250                  | FK26X7R2E223K |               |
| X7R                         | 33000pF     | ±10%      | 250                  | FK26X7R2E333K |               |
| X7R                         | 47000pF     | ±10%      | 250                  | FK26X7R2E473K |               |
| X7R                         | 68000pF     | ±10%      | 250                  | FK26X7R2E683K |               |
| X7R                         | 0.1μF       | ±10%      | 250                  | FK26X7R2E104K |               |
| X7R                         | 1000pF      | ±10%      | 630                  | FK26X7R2J102K |               |
| X7R                         | 1500pF      | ±10%      | 630                  | FK26X7R2J152K |               |
| X7R                         | 2200pF      | ±10%      | 630                  | FK26X7R2J222K |               |
| X7R                         | 3300pF      | ±10%      | 630                  | FK26X7R2J332K |               |
| X7R                         | 4700pF      | ±10%      | 630                  | FK26X7R2J472K |               |
| X7R                         | 6800pF      | ±10%      | 630                  | FK26X7R2J682K |               |
| X7R                         | 10000pF     | ±10%      | 630                  | FK26X7R2J103K |               |
| X7R                         | 15000pF     | ±10%      | 630                  | FK26X7R2J153K |               |
| X7R                         | 22000pF     | ±10%      | 630                  | FK26X7R2J223K |               |
| X7R                         | 33000pF     | ±10%      | 630                  | FK26X7R2J333K |               |

## FK20 AND FK11 TYPES

### SHAPES AND DIMENSIONS



#### RATED VOLTAGE Edc: 100 to 630V

| Temperature characteristics | Capacitance  | Tolerance  | Rated voltage Edc(V) | Part No.      |               |
|-----------------------------|--------------|------------|----------------------|---------------|---------------|
|                             |              |            |                      | FK20 type     | FK11 type     |
| X7R                         | 0.33 $\mu$ F | $\pm 10\%$ | 100                  | FK20X7R2A334K | FK11X7R2A334K |
| X7R                         | 0.47 $\mu$ F | $\pm 10\%$ | 100                  | FK20X7R2A474K | FK11X7R2A474K |
| X7R                         | 0.68 $\mu$ F | $\pm 10\%$ | 100                  | FK20X7R2A684K | FK11X7R2A684K |
| X7R                         | 1 $\mu$ F    | $\pm 10\%$ | 100                  | FK20X7R2A105K | FK11X7R2A105K |
| X7R                         | 1.5 $\mu$ F  | $\pm 10\%$ | 100                  | FK20X7R2A155K | FK11X7R2A155K |
| X7R                         | 2.2 $\mu$ F  | $\pm 10\%$ | 100                  | FK20X7R2A225K | FK11X7R2A225K |
| X7S                         | 3.3 $\mu$ F  | $\pm 10\%$ | 100                  | FK20X7S2A335K | FK11X7S2A335K |
| X7S                         | 4.7 $\mu$ F  | $\pm 10\%$ | 100                  | FK20X7S2A475K | FK11X7S2A475K |
| X7R                         | 0.1 $\mu$ F  | $\pm 10\%$ | 250                  | FK20X7R2E104K |               |
| X7R                         | 0.15 $\mu$ F | $\pm 10\%$ | 250                  | FK20X7R2E154K |               |
| X7R                         | 0.22 $\mu$ F | $\pm 10\%$ | 250                  | FK20X7R2E224K |               |
| X7R                         | 47000pF      | $\pm 10\%$ | 630                  | FK20X7R2J473K |               |
| X7R                         | 68000pF      | $\pm 10\%$ | 630                  | FK20X7R2J683K |               |

## FK22 TYPE

### SHAPES AND DIMENSIONS



#### RATED VOLTAGE Edc: 100 to 630V

| Temperature characteristics | Capacitance  | Tolerance  | Rated voltage Edc(V) | Part No.      |
|-----------------------------|--------------|------------|----------------------|---------------|
|                             |              |            |                      | FK22 type     |
| X7R                         | 0.68 $\mu$ F | $\pm 10\%$ | 100                  | FK22X7R2A684K |
| X7R                         | 1 $\mu$ F    | $\pm 10\%$ | 100                  | FK22X7R2A105K |
| X7R                         | 1.5 $\mu$ F  | $\pm 10\%$ | 100                  | FK22X7R2A155K |
| X7R                         | 2.2 $\mu$ F  | $\pm 10\%$ | 100                  | FK22X7R2A225K |
| X7R                         | 0.15 $\mu$ F | $\pm 10\%$ | 250                  | FK22X7R2E154K |
| X7R                         | 0.22 $\mu$ F | $\pm 10\%$ | 250                  | FK22X7R2E224K |
| X7R                         | 0.33 $\mu$ F | $\pm 10\%$ | 250                  | FK22X7R2E334K |
| X7R                         | 0.47 $\mu$ F | $\pm 10\%$ | 250                  | FK22X7R2E474K |
| X7R                         | 0.1 $\mu$ F  | $\pm 10\%$ | 630                  | FK22X7R2J104K |

• For more information about products with other capacitance or other data, please contact us.

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.

## PACKAGING STYLES

## TAPING DIMENSIONS

## FK1 Series

(FK18, FK14, FK16, FK11 Types)



| Symbol                       | Dimensions (mm) |
|------------------------------|-----------------|
| P                            | 12.7±1.0        |
| P <sub>0</sub> <sup>*1</sup> | 12.7±0.3        |
| P <sub>1</sub>               | 5.1±0.7         |
| P <sub>2</sub>               | 6.35±1.3        |
| W <sub>0</sub>               | 12.0±1.0        |
| W <sub>1</sub>               | 9.0±0.5         |
| W <sub>2</sub> <sup>*2</sup> | 3.0max.         |
| W <sub>3</sub>               | 18.0+1.0, -0.5  |
| H <sub>0</sub>               | 16.0±0.5        |
| l                            | 1.0max.         |
| t                            | 0.6±0.2         |
| L <sub>0</sub> <sup>*3</sup> | 11.0max.        |
| F                            | 2.5+0.5, -0.2   |
| 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.

## FK2 Series

(FK28, FK24, FK26, FK20, FK22 Types)



| Symbol                       | Dimensions (mm) |
|------------------------------|-----------------|
| P                            | 12.7±1.0        |
| P <sub>0</sub> <sup>*1</sup> | 12.7±0.3        |
| P <sub>1</sub>               | 3.85±0.7        |
| P <sub>2</sub>               | 6.35±1.3        |
| W <sub>0</sub>               | 12.0±1.0        |
| W <sub>1</sub>               | 9.0±0.5         |
| W <sub>2</sub> <sup>*2</sup> | 3.0max.         |
| W <sub>3</sub>               | 18.0+1.0, -0.5  |
| H <sub>0</sub>               | 16.0±0.5        |
| l                            | 1.0max.         |
| t                            | 0.6±0.2         |
| L <sub>0</sub> <sup>*3</sup> | 11.0max.        |
| F                            | 5.0+0.8, -0.2   |
| 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.

## PACKAGING QUANTITIES

| Type       | Quantity         |
|------------|------------------|
| FK28, FK18 | 2000 pieces/1box |
| FK24, FK14 |                  |
| FK26, FK16 |                  |
| FK20, FK11 | 1500 pieces/1box |
| FK22       |                  |