

# **MLCC with Dipped Radial Lead**

## **Commercial Grade**

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

**FK Series**

**Type:** **FK28, FK18**  
**FK24, FK14**  
**FK26, FK16**  
**FK20, FK11**  
**FK22**

**Issue date:** March 2013

- All specifications are subject to change without notice.
- Conformity to RoHS Directive: This means that, in conformity with EU Directive 2002/95/EC, lead, cadmium, mercury, hexavalent chromium, and specific bromine-based flame retardants, PBB and PBDE, have not been used, except for exempted applications.

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### 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.

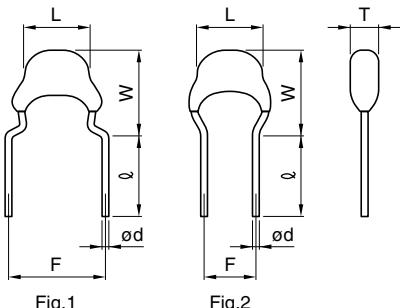
- Taping specifications are available for automatic insertions, which contribute to reduce on-board costs.

### 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	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

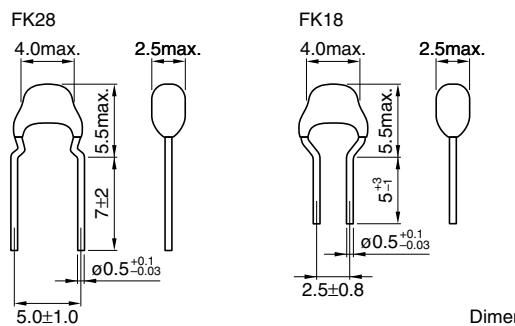
(6) Capacitance tolerance

Symbol	Tolerance
J	±5%
K	±10%

(7) TDK internal code

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**CAPACITANCE RANGES: CLASS 1 (TEMPERATURE COMPENSATION)**
**FK28 AND FK18 TYPES**
**SHAPES AND DIMENSIONS**


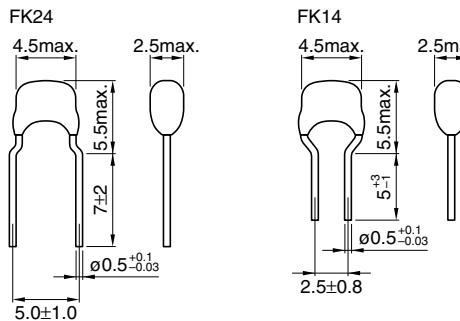
Dimensions in mm

RATED VOLTAGE Edc: 100 to 250V

Temperature characteristics	Capacitance	Tolerance	Rated voltage Edc(V)	Part No. FK28 type	Part No. 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

- All specifications are subject to change without notice.

## FK24 AND FK14 TYPES SHAPES AND DIMENSIONS



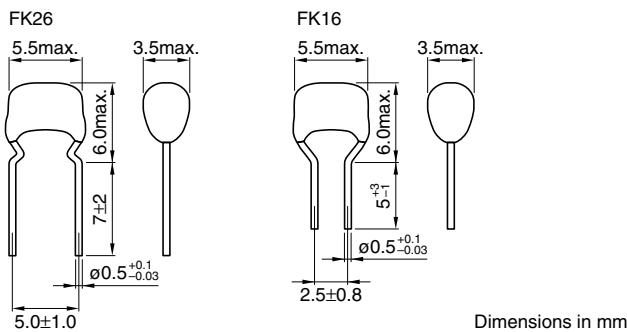
Dimensions in mm

RATED VOLTAGE Edc: 100 to 250V

Temperature characteristics	Capacitance	Tolerance	Rated voltage Edc(V)	Part No.
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

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## FK26 AND FK16 TYPES SHAPES AND DIMENSIONS



Dimensions in mm

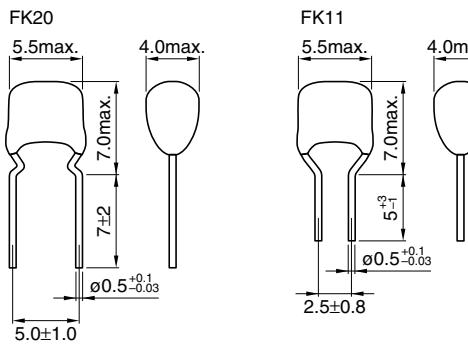
### RATED VOLTAGE Edc: 100 to 630V

Temperature characteristics	Capacitance	Tolerance	Rated voltage Edc(V)	Part No.
				FK26 type
				FK16 type
C0G	3900pF	±5%	100	FK26C0G2A392J
C0G	4700pF	±5%	100	FK16C0G2A392J
C0G	5600pF	±5%	100	FK26C0G2A562J
C0G	6800pF	±5%	100	FK16C0G2A682J
C0G	8200pF	±5%	100	FK26C0G2A822J
C0G	10000pF	±5%	100	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

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## FK20 AND FK11 TYPES

### SHAPES AND DIMENSIONS



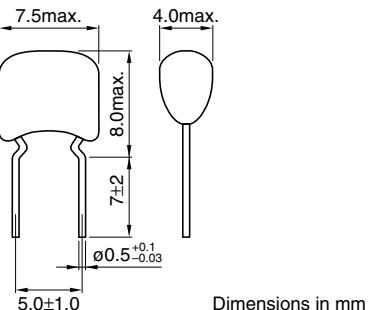
Dimensions in mm

### RATED VOLTAGE Edc: 100 to 630V

Temperature characteristics	Capacitance	Tolerance	Rated voltage Edc(V)	Part No.
				FK20 type
				FK11 type
C0G	15000pF	±5%	100	FK20C0G2A153J
C0G	22000pF	±5%	100	FK11C0G2A153J
C0G	33000pF	±5%	100	FK20C0G2A333J
C0G	47000pF	±5%	100	FK11C0G2A473J
C0G	10000pF	±5%	250	FK20C0G2E103J
C0G	15000pF	±5%	250	FK11C0G2E153J
C0G	3900pF	±5%	630	FK20C0G2J392J
C0G	4700pF	±5%	630	FK11C0G2J472J
C0G	5600pF	±5%	630	FK20C0G2J562J
C0G	6800pF	±5%	630	FK11C0G2J682J

## FK22 TYPE

### SHAPES AND DIMENSIONS

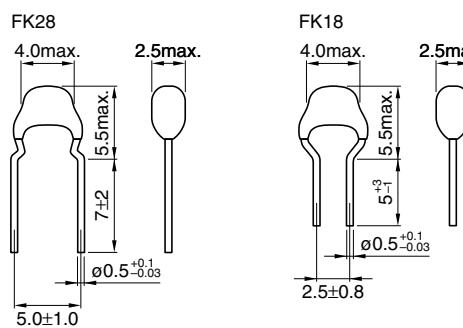


Dimensions in mm

### RATED VOLTAGE Edc: 100 to 630V

Temperature characteristics	Capacitance	Tolerance	Rated voltage Edc(V)	Part No.
				FK22 type
C0G	68000pF	±5%	100	FK22C0G2A683J
C0G	0.1µF	±5%	100	FK22C0G2A104J
C0G	22000pF	±5%	250	FK22C0G2E223J
C0G	33000pF	±5%	250	FK22C0G2E333J
C0G	47000pF	±5%	250	FK22C0G2E473J
C0G	8200pF	±5%	630	FK22C0G2J822J
C0G	10000pF	±5%	630	FK22C0G2J103J
C0G	15000pF	±5%	630	FK22C0G2J153J
C0G	22000pF	±5%	630	FK22C0G2J223J

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**CAPACITANCE RANGES: CLASS 2 (TEMPERATURE STABLE)**
**FK28 AND FK18 TYPES**
**SHAPES AND DIMENSIONS**


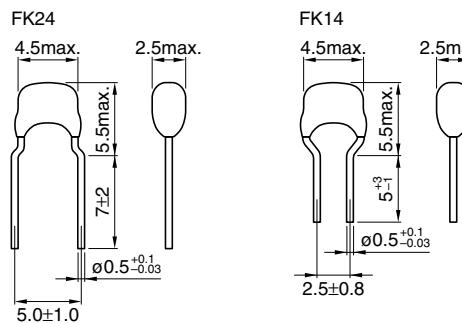
Dimensions in mm

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

Temperature characteristics	Capacitance	Tolerance	Rated voltage Edc(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

- All specifications are subject to change without notice.

## FK24 AND FK14 TYPES SHAPES AND DIMENSIONS



Dimensions in mm

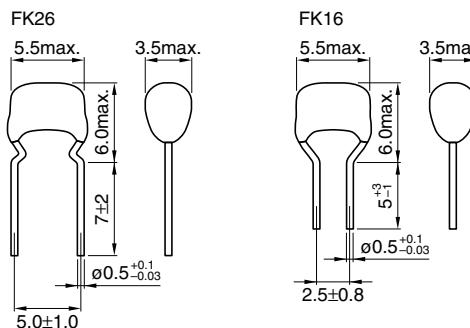
### RATED VOLTAGE Edc: 100 to 250V

Temperature characteristics	Capacitance	Tolerance	Rated voltage Edc(V)	Part No.
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

- All specifications are subject to change without notice.

## FK26 AND FK16 TYPES

### SHAPES AND DIMENSIONS



Dimensions in mm

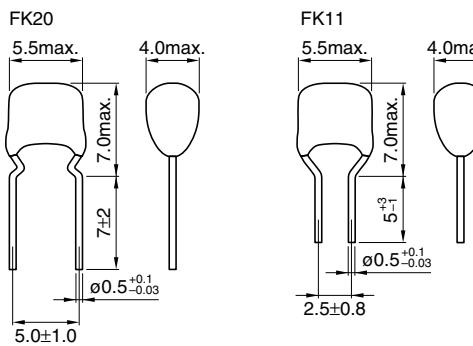
RATED VOLTAGE Edc: 100 to 630V

Temperature characteristics	Capacitance	Tolerance	Rated voltage Edc(V)	Part No.
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

- All specifications are subject to change without notice.

## FK20 AND FK11 TYPES

### SHAPES AND DIMENSIONS



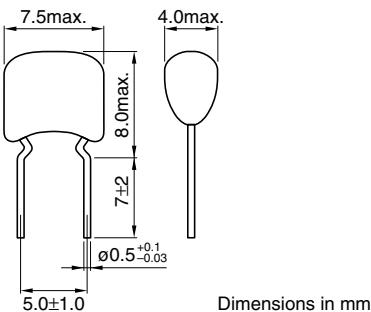
Dimensions in mm

### RATED VOLTAGE Edc: 100 to 630V

Temperature characteristics	Capacitance	Tolerance	Rated voltage Edc(V)	Part No.
				FK20 type
				FK11 type
X7R	0.33µF	±10%	100	FK20X7R2A334K
X7R	0.47µF	±10%	100	FK11X7R2A334K
X7R	0.68µF	±10%	100	FK20X7R2A684K
X7R	1µF	±10%	100	FK11X7R2A105K
X7R	1.5µF	±10%	100	FK20X7R2A155K
X7R	2.2µF	±10%	100	FK11X7R2A225K
X7S	3.3µF	±10%	100	FK20X7S2A335K
X7S	4.7µF	±10%	100	FK11X7S2A335K
X7R	0.1µF	±10%	250	FK20X7R2E104K
X7R	0.15µF	±10%	250	FK20X7R2E154K
X7R	0.22µF	±10%	250	FK20X7R2E224K
X7R	47000pF	±10%	630	FK20X7R2J473K
X7R	68000pF	±10%	630	FK20X7R2J683K

## FK22 TYPE

### SHAPES AND DIMENSIONS



Dimensions in mm

### RATED VOLTAGE Edc: 100 to 630V

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

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

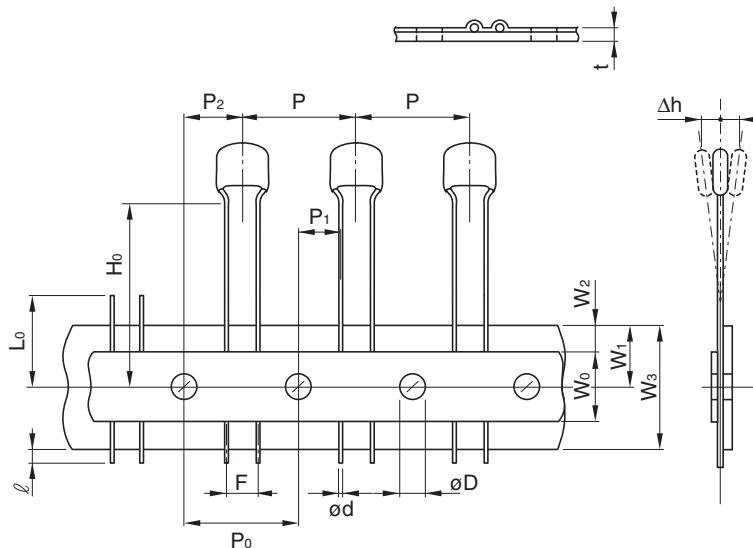
- All specifications are subject to change without notice.

## PACKAGING STYLES

## TAPING DIMENSIONS

## FK1 Series

(FK18, FK14, FK16, FK11 Types)

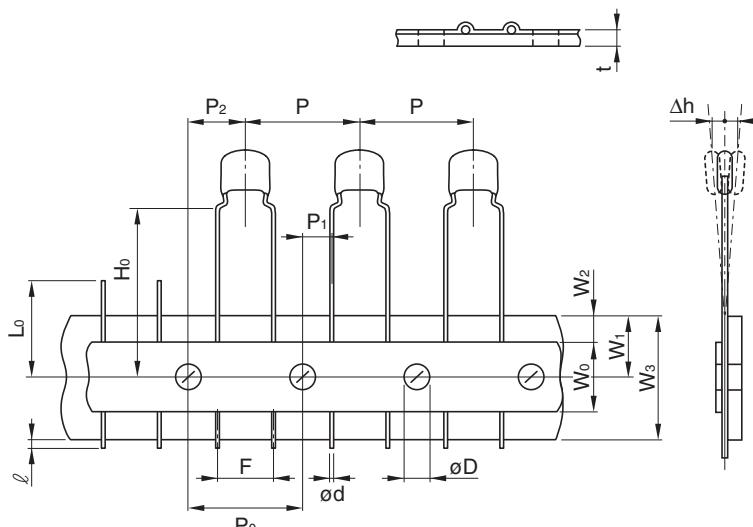


Symbol	Dimensions (mm)
P	12.7±1.0
P <sub>0</sub> <sup>*1</sup>	12.7±0.3
P <sub>1</sub>	5.1±0.7
P <sub>2</sub>	6.35±1.3
W <sub>0</sub>	12.0±1.0
W <sub>1</sub>	9.0±0.5
W <sub>2</sub> <sup>*2</sup>	3.0max.
W <sub>3</sub>	18.0+1.0, -0.5
H <sub>0</sub>	16.0±0.5
ℓ	1.0max.
t	0.6±0.2
L <sub>0</sub> <sup>*3</sup>	11.0max.
F	2.5+0.5, -0.2
Φd	Φ0.5±0.1, -0.03
ΦD	Φ4.0±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
Φd	Φ0.5±0.1, -0.03
ΦD	Φ4.0±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	
FK24, FK14	2000 pieces/1box
FK26, FK16	
FK20, FK11	
FK22	1500 pieces/1box

- All specifications are subject to change without notice.