

# MLCC with Dipped Radial Lead

Commercial Grade

General (Up to 50V)

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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# MLCC with Dipped Radial Lead Commercial Grade

Conformity to RoHS Directive

## General (Up to 50V) FK 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



| Dimensions in mm |        |        |        |         |        |               |     |
|------------------|--------|--------|--------|---------|--------|---------------|-----|
| 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     |

(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

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

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

| Temperature characteristics | Capacitance | Tolerance | Rated voltage E <sub>dc</sub> (V) | Part No.<br>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 |

## FK24 AND FK14 TYPES

### SHAPES AND DIMENSIONS

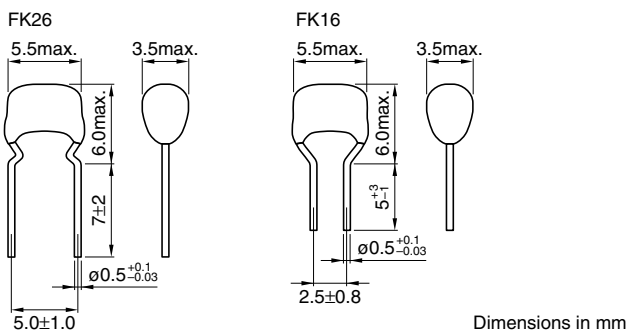


#### RATED VOLTAGE Edc: 50V

| 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

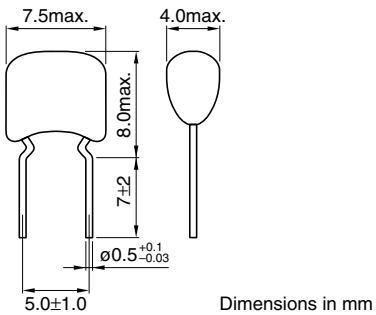


#### RATED VOLTAGE Edc: 50V

| 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



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

| Temperature characteristics | Capacitance | Tolerance | Rated voltage E <sub>dc</sub> (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 |

**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

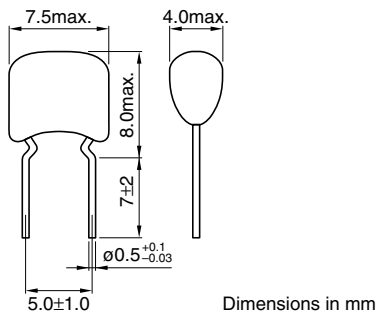


### RATED VOLTAGE Edc: 6.3 to 50V

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

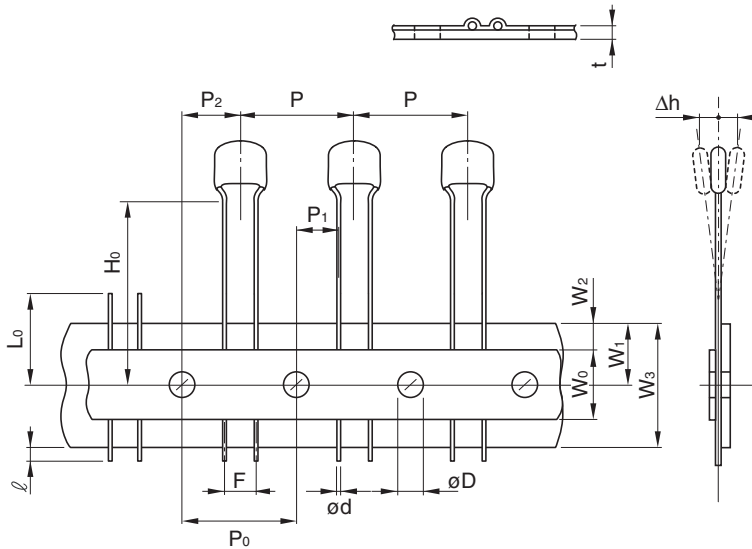
• All specifications are subject to change without notice.

## PACKAGING STYLES

### TAPING DIMENSIONS

#### FK1 Series

(FK18, FK14, FK16, FK11 Types)

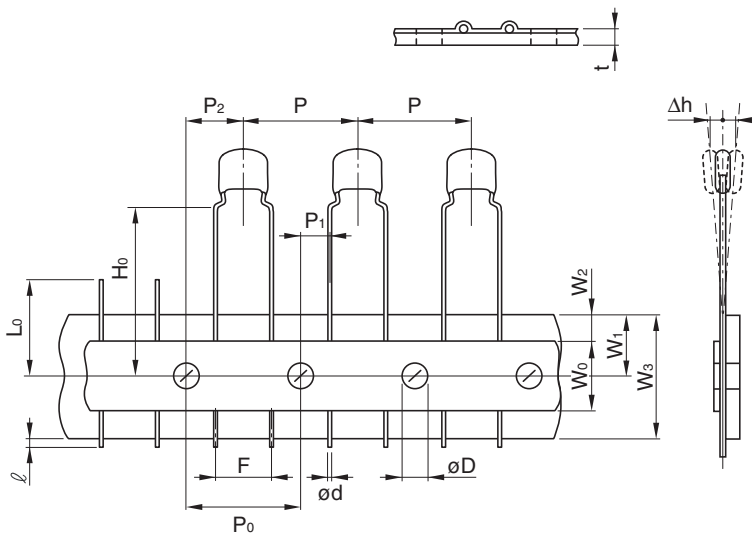


| Symbol            | Dimensions (mm) |
|-------------------|-----------------|
| P                 | 12.7±1.0        |
| P <sub>0</sub> *1 | 12.7±0.3        |
| P <sub>1</sub>    | 5.1±0.7         |
| P <sub>2</sub>    | 6.35±1.3        |
| W <sub>0</sub>    | 12.0±1.0        |
| W <sub>1</sub>    | 9.0±0.5         |
| W <sub>2</sub> *2 | 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> *3 | 11.0max.        |
| F                 | 2.5+0.5, -0.2   |
| ød                | ø0.5+0.1, -0.03 |
| øD                | ø4.0±0.2        |
| Δh                | 0±2             |

- \*1 Accumulated pitch tolerance shall be ±2mm for 20 pitches.  
 \*2 Adhesive tape shall not stick out from carrier tape.  
 \*3 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> *1 | 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> *2 | 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> *3 | 11.0max.        |
| F                 | 5.0+0.8, -0.2   |
| ød                | ø0.5+0.1, -0.03 |
| øD                | ø4.0±0.2        |
| Δh                | 0±2             |

- \*1 Accumulated pitch tolerance shall be ±2mm for 20 pitches.  
 \*2 Adhesive tape shall not stick out from carrier tape.  
 \*3 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 | 1500 pieces/1box |
| FK22       |                  |

Компания «Океан Электроники» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Поставка оригинальных импортных электронных компонентов напрямую с производств Америки, Европы и Азии, а так же с крупнейших складов мира;
- Широкая линейка поставок активных и пассивных импортных электронных компонентов (более 30 млн. наименований);
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Помощь Конструкторского Отдела и консультации квалифицированных инженеров;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Поставка электронных компонентов под контролем ВП;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- При необходимости вся продукция военного и аэрокосмического назначения проходит испытания и сертификацию в лаборатории (по согласованию с заказчиком);
- Поставка специализированных компонентов военного и аэрокосмического уровня качества (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Actel, Aeroflex, Peregrine, VPT, Syfer, Eurofarad, Texas Instruments, MS Kennedy, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Компания «Океан Электроники» является официальным дистрибьютором и эксклюзивным представителем в России одного из крупнейших производителей разъемов военного и аэрокосмического назначения «JONHON», а так же официальным дистрибьютором и эксклюзивным представителем в России производителя высокотехнологичных и надежных решений для передачи СВЧ сигналов «FORSTAR».



## JONHON

«JONHON» (основан в 1970 г.)

Разъемы специального, военного и аэрокосмического назначения:

(Применяются в военной, авиационной, аэрокосмической, морской, железнодорожной, горно- и нефтедобывающей отраслях промышленности)

«FORSTAR» (основан в 1998 г.)

ВЧ соединители, коаксиальные кабели, кабельные сборки и микроволновые компоненты:

(Применяются в телекоммуникациях гражданского и специального назначения, в средствах связи, РЛС, а так же военной, авиационной и аэрокосмической отраслях промышленности).



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