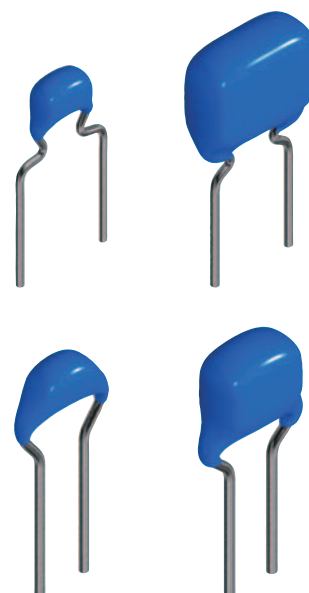


MLCC with dipped radial lead

(Halogen-free, automotive grade, high temperature application)

FA series (NP0, X8R)

Type:	Lead pitch	5.0 mm FA28 [4.0x5.5 mm] FA24 [4.5x5.5 mm] FA26 [5.5x6.0 mm] FA20 [5.5x7.0 mm] FA22 [7.5x8.5 mm] FA23 [8.5x11.0 mm]
	Lead pitch	2.5 mm FA18 [4.0x5.5 mm] FA14 [4.5x5.5 mm] FA16 [5.5x6.0 mm] FA11 [5.5x7.0 mm]



REMINDERS FOR USING THESE PRODUCTS

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

SAFETY REMINDERS

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

REMINDERS

1. The products listed in this specification are intended for use in automotive applications under normal operation and usage conditions. The products are not designed or warranted to meet the requirements of the applications listed below, whose performance and/or quality requires a more stringent level of safety or reliability, or whose failure, malfunction or defect could cause serious damage to society, person or property.

Please understand that we are not responsible for any damage or liability caused by use of the products in any of the applications below or for any other use exceeding the range or conditions set forth in this specification sheet. If you intend to use the products in the applications listed below or if you have special requirements exceeding the range or conditions set forth in this specification, please contact us.

- | | |
|--|--|
| (1) Aerospace/aviation equipment | (8) Public information-processing equipment |
| (2) Transportation equipment (electric trains, ships, etc.) | (9) Military equipment |
| (3) Medical equipment (excepting Pharmaceutical Affairs Law classification Class1,2) | (10) Electric heating apparatus, burning equipment |
| (4) Power-generation control equipment | (11) Disaster prevention/crime prevention equipment |
| (5) Atomic energy-related equipment | (12) Safety equipment |
| (6) Seabed equipment | (13) Other applications that are not considered general-purpose applications |
| (7) Transportation control equipment | |

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

In addition, although the products listed in this specification are intended for use in automotive applications as described above, they are not prohibited to use in general electronic equipment, whose performance and/or quality doesn't require a more stringent level of safety or reliability, or whose failure, malfunction or defect could not cause serious damage to society, person or property. Therefore, the description of this caution will be applied, when the products are used in general electronic equipment under a normal operation and usage conditions.

2. We may modify products or discontinue production of a product listed in this catalog without prior notification.
3. We provide "Delivery Specification" that explain precautions for the specifications and safety of each product listed in this catalog. We strongly recommend that you exchange these delivery specifications with customers that use one of these products.
4. If you plan to export a product listed in this catalog, keep in mind that it may be a restricted item according to the "Foreign Exchange and Foreign Trade Control Law". In such cases, it is necessary to acquire export permission in harmony with this law.
5. Any reproduction or transferring of the contents of this catalog is prohibited without prior permission from our company.
6. We are not responsible for problems that occur related to the intellectual property rights or other rights of our company or a third party when you use a product listed in this catalog. We do not grant license of these rights.
7. This catalog only applies to products purchased through our company or one of our company's official agencies. This catalog does not apply to products that are purchased through other third parties.

MLCC with dipped radial lead

Product compatible with RoHS directive
Halogen-free

Halogen-free, automotive grade, high temperature application

Overview of the FA series

FEATURES

- A lineup with a rated voltage of 25V to 630V.
- Compatible with a wide capacitance range of 10pF to 4.7μF.
- For guaranteed applications withstanding rigorous temperature environments of up to 150°C.
- The FA series for automotive use is AEC-Q200 compliant.

APPLICATION

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

PART NUMBER CONSTRUCTION

FA	2	8	NP0	1H	100	D		
Series name	Lead pitch (mm)	LxWxT dimensions (mm)	Capacitance temperature characteristics	Rated voltage (V)	Nominal capacitance	Capacitance tolerance*	Internal code	Packaging style**
	1 2.5 2 5.0	8 4.0x5.5x2.5 4 4.5x5.5x3.0 6 5.5x6.0x3.5 0 5.5x7.0x4.0 1 5.5x7.0x4.0 2 7.5x8.5x4.5 3 8.5x11.0x5.5	NP0 0±30ppm/°C X8R ±15%	1E 25 1H 50 2A 100 2E 250 2W 450 2J 630	100 10pF 101 100pF 102 1,000pF 105 1μF	D ±0.5pF J ±5% K ±10%		0 Bulk 6 Taping

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

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

OPERATING TEMPERATURE RANGE

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

* The maximum operating temperature includes capacitor self-generated heat of up to 20°C.

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

○ RoHS Directive Compliant Product: See the following for more details. <https://product.tdk.com/info/en/environment/rohs/index.html>

○ Halogen-free: indicates that Cl content is less than 900ppm, Br content is less than 900ppm, and that the total Cl and Br content is less than 1500ppm.

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

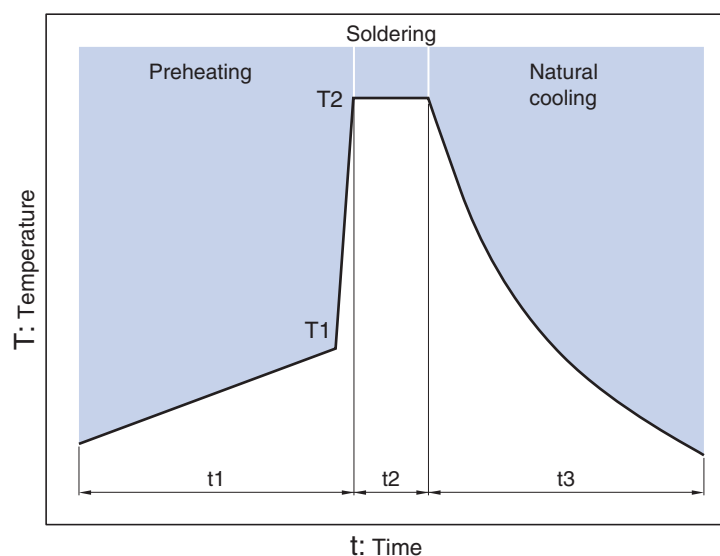
Overview of the FA series

■ PACKAGE QUANTITY

Type	Package quantity	
	Taping (pieces / box)	Bulk (pieces / bag)
FA28	2000	500
FA24	2000	500
FA26	2000	500
FA20	1500	500
FA22	1000	500
FA23	1000	200
FA18	2000	500
FA14	2000	500
FA16	2000	500
FA11	1500	500

Overview of the FA series

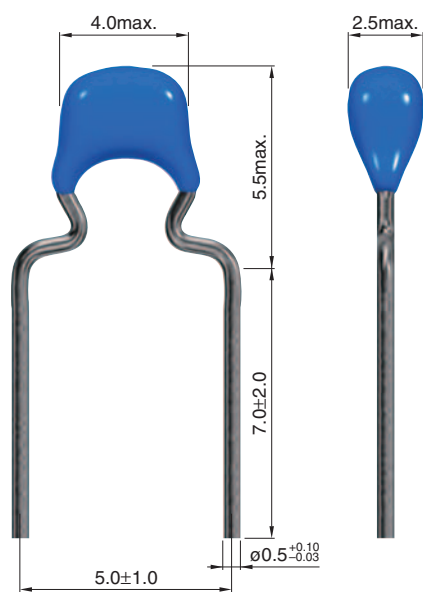
RECOMMENDED FLOW PROFILE



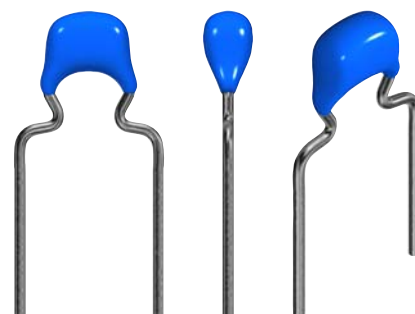
Preheating		Peak		Natural cooling
Temp.	Time	Temp.	Time	Time
T1	t1	T2	t2	t3
110°C min.	Over 60s.	260°C	Within 5s.	Over 60s.

FA28 type

■ SHAPE & DIMENSIONS



Dimensions in mm



FA28 type

■ ELECTRICAL CHARACTERISTICS

□ CHARACTERISTICS SPECIFICATION TABLE

CLASS 1 (TEMPERATURE COMPENSATION)

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

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

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

FA28 type

■ ELECTRICAL CHARACTERISTICS

□ CHARACTERISTICS SPECIFICATION TABLE

CLASS 1 (TEMPERATURE COMPENSATION)

Temperature characteristics	Capacitance	Tolerance	Rated voltage Edc (V)	Part No.*
NP0	1nF	±5%	100	FA28NP02A102JNU0□**
NP0	1.2nF	±5%	100	FA28NP02A122JNU0□
NP0	1.5nF	±5%	100	FA28NP02A152JNU0□
NP0	1.8nF	±5%	100	FA28NP02A182JNU0□
NP0	2.2nF	±5%	100	FA28NP02A222JNU0□
NP0	2.7nF	±5%	100	FA28NP02A272JNU0□
NP0	3.3nF	±5%	100	FA28NP02A332JNU0□
NP0	820pF	±5%	250	FA28NP02E821JNU0□
NP0	1nF	±5%	250	FA28NP02E102JNU0□
NP0	1.2nF	±5%	250	FA28NP02E122JNU0□
NP0	1.5nF	±5%	250	FA28NP02E152JNU0□
NP0	1.8nF	±5%	250	FA28NP02E182JNU0□
NP0	2.2nF	±5%	250	FA28NP02E222JNU0□

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

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

FA28 type

ELECTRICAL CHARACTERISTICS

CHARACTERISTICS SPECIFICATION TABLE

CLASS 2 (TEMPERATURE STABLE)

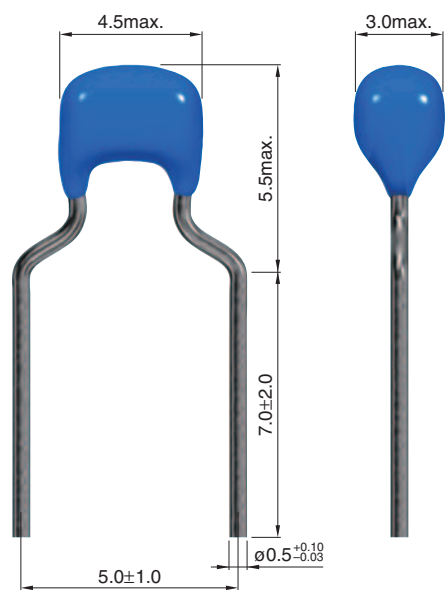
Temperature characteristics	Capacitance	Tolerance	Rated voltage Edc (V)	Part No.*
X8R	68nF	±10%	25	FA28X8R1E683KNU0□**
X8R	100nF	±10%	25	FA28X8R1E104KNU0□
X8R	150nF	±10%	25	FA28X8R1E154KRU0□
X8R	220nF	±10%	25	FA28X8R1E224KRU0□
X8R	1nF	±10%	50	FA28X8R1H102KNU0□
X8R	1.5nF	±10%	50	FA28X8R1H152KNU0□
X8R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

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

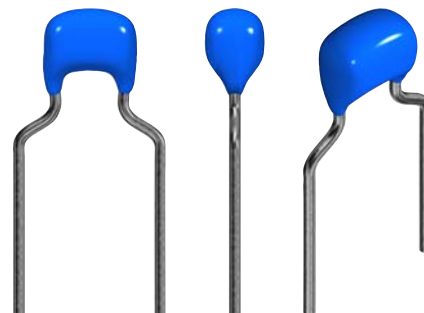
** The "□" of the Part Number contains the packaging symbol, 0 (Bulk packaging) or 6 (Taping packaging).

FA24 type

■ SHAPE & DIMENSIONS



Dimensions in mm



FA24 type

ELECTRICAL CHARACTERISTICS

CHARACTERISTICS SPECIFICATION TABLE

CLASS 1 (TEMPERATURE COMPENSATION)

Temperature characteristics	Capacitance	Tolerance	Rated voltage Edc (V)	Part No.*
NP0	15nF	±5%	50	FA24NP01H153JNU0□**
NP0	22nF	±5%	50	FA24NP01H223JNU0□
NP0	33nF	±5%	50	FA24NP01H333JNU0□
NP0	3.9nF	±5%	100	FA24NP02A392JNU0□
NP0	4.7nF	±5%	100	FA24NP02A472JNU0□
NP0	5.6nF	±5%	100	FA24NP02A562JNU0□
NP0	6.8nF	±5%	100	FA24NP02A682JNU0□
NP0	8.2nF	±5%	100	FA24NP02A822JNU0□
NP0	10nF	±5%	100	FA24NP02A103JNU0□
NP0	3.3nF	±5%	250	FA24NP02E332JNU0□
NP0	3.9nF	±5%	250	FA24NP02E392JNU0□
NP0	4.7nF	±5%	250	FA24NP02E472JNU0□
NP0	5.6nF	±5%	250	FA24NP02E562JNU0□
NP0	6.8nF	±5%	250	FA24NP02E682JNU0□
NP0	8.2nF	±5%	250	FA24NP02E822JNU0□
NP0	10nF	±5%	250	FA24NP02E103JNU0□
NP0	100pF	±5%	450	FA24NP02W101JNU0□
NP0	120pF	±5%	450	FA24NP02W121JNU0□
NP0	150pF	±5%	450	FA24NP02W151JNU0□
NP0	180pF	±5%	450	FA24NP02W181JNU0□
NP0	220pF	±5%	450	FA24NP02W221JNU0□
NP0	270pF	±5%	450	FA24NP02W271JNU0□
NP0	330pF	±5%	450	FA24NP02W331JNU0□
NP0	390pF	±5%	450	FA24NP02W391JNU0□
NP0	470pF	±5%	450	FA24NP02W471JNU0□
NP0	560pF	±5%	450	FA24NP02W561JNU0□
NP0	680pF	±5%	450	FA24NP02W681JNU0□
NP0	820pF	±5%	450	FA24NP02W821JNU0□
NP0	1nF	±5%	450	FA24NP02W102JNU0□
NP0	1.2nF	±5%	450	FA24NP02W122JNU0□
NP0	1.5nF	±5%	450	FA24NP02W152JNU0□
NP0	1.8nF	±5%	450	FA24NP02W182JNU0□
NP0	2.2nF	±5%	450	FA24NP02W222JNU0□
NP0	2.7nF	±5%	450	FA24NP02W272JNU0□
NP0	3.3nF	±5%	450	FA24NP02W332JNU0□
NP0	3.9nF	±5%	450	FA24NP02W392JNU0□
NP0	4.7nF	±5%	450	FA24NP02W472JNU0□
NP0	5.6nF	±5%	450	FA24NP02W562JNU0□

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

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

CLASS 2 (TEMPERATURE STABLE)

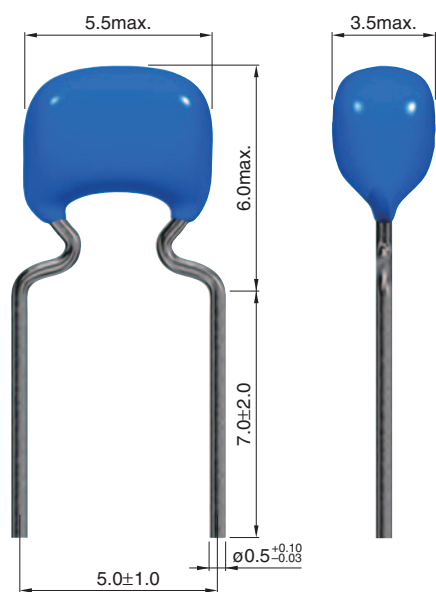
Temperature characteristics	Capacitance	Tolerance	Rated voltage Edc (V)	Part No.*
X8R	150nF	±10%	25	FA24X8R1E154KNU0□**
X8R	220nF	±10%	25	FA24X8R1E224KNU0□
X8R	330nF	±10%	25	FA24X8R1E334KNU0□
X8R	470nF	±10%	25	FA24X8R1E474KRU0□
X8R	68nF	±10%	50	FA24X8R1H683KNU0□
X8R	100nF	±10%	50	FA24X8R1H104KNU0□
X8R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

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

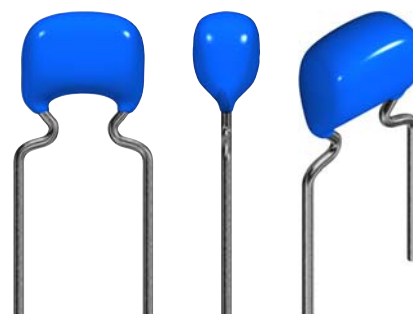
** The "□" of the Part Number contains the packaging symbol, 0 (Bulk packaging) or 6 (Taping packaging).

FA26 type

■ SHAPE & DIMENSIONS



Dimensions in mm



FA26 type

ELECTRICAL CHARACTERISTICS

CHARACTERISTICS SPECIFICATION TABLE

CLASS 1 (TEMPERATURE COMPENSATION)

Temperature characteristics	Capacitance	Tolerance	Rated voltage Edc (V)	Part No.*
NP0	47nF	±5%	50	FA26NP01H473JNU0□**
NP0	68nF	±5%	50	FA26NP01H683JNU0□
NP0	100nF	±5%	50	FA26NP01H104JNU0□
NP0	15nF	±5%	100	FA26NP02A153JNU0□
NP0	22nF	±5%	100	FA26NP02A223JNU0□
NP0	33nF	±5%	100	FA26NP02A333JNU0□
NP0	15nF	±5%	250	FA26NP02E153JNU0□
NP0	22nF	±5%	250	FA26NP02E223JNU0□
NP0	6.8nF	±5%	450	FA26NP02W682JNU0□
NP0	8.2nF	±5%	450	FA26NP02W822JNU0□
NP0	10nF	±5%	450	FA26NP02W103JNU0□
NP0	15nF	±5%	450	FA26NP02W153JNU0□
NP0	3.9nF	±5%	630	FA26NP02J392JNU0□
NP0	4.7nF	±5%	630	FA26NP02J472JNU0□
NP0	5.6nF	±5%	630	FA26NP02J562JNU0□
NP0	6.8nF	±5%	630	FA26NP02J682JNU0□
NP0	8.2nF	±5%	630	FA26NP02J822JNU0□
NP0	10nF	±5%	630	FA26NP02J103JNU0□

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

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

CLASS 2 (TEMPERATURE STABLE)

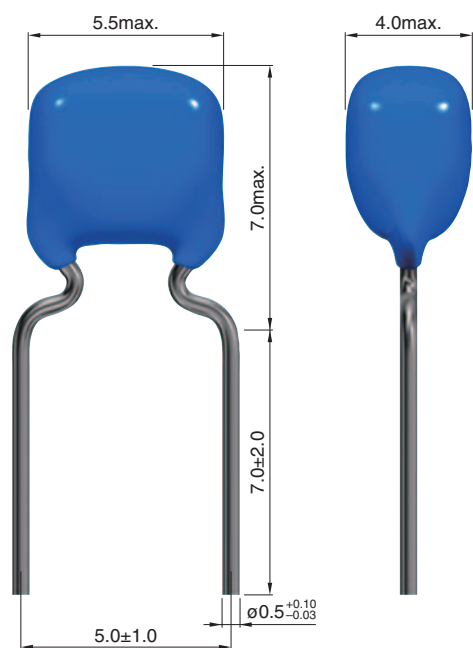
Temperature characteristics	Capacitance	Tolerance	Rated voltage Edc (V)	Part No.*
X8R	470nF	±10%	25	FA26X8R1E474KNU0□**
X8R	680nF	±10%	25	FA26X8R1E684KNU0□
X8R	1μF	±10%	25	FA26X8R1E105KNU0□
X8R	1.5μF	±10%	25	FA26X8R1E155KRU0□
X8R	2.2μF	±10%	25	FA26X8R1E225KRU0□
X8R	150nF	±10%	50	FA26X8R1H154KNU0□
X8R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

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

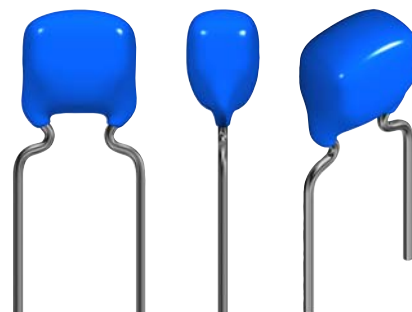
** The "□" of the Part Number contains the packaging symbol, 0 (Bulk packaging) or 6 (Taping packaging).

FA20 type

■ SHAPE & DIMENSIONS



Dimensions in mm



FA20 type

■ ELECTRICAL CHARACTERISTICS

□ CHARACTERISTICS SPECIFICATION TABLE

CLASS 1 (TEMPERATURE COMPENSATION)

Temperature characteristics	Capacitance	Tolerance	Rated voltage Edc (V)	Part No.*
NP0	68nF	±5%	100	FA20NP02A683JNU0□**
NP0	33nF	±5%	250	FA20NP02E333JNU0□
NP0	47nF	±5%	250	FA20NP02E473JNU0□
NP0	22nF	±5%	450	FA20NP02W223JNU0□
NP0	33nF	±5%	450	FA20NP02W333JNU0□
NP0	15nF	±5%	630	FA20NP02J153JNU0□
NP0	22nF	±5%	630	FA20NP02J223JNU0□
NP0	33nF	±5%	630	FA20NP02J333JNU0□

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

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

CLASS 2 (TEMPERATURE STABLE)

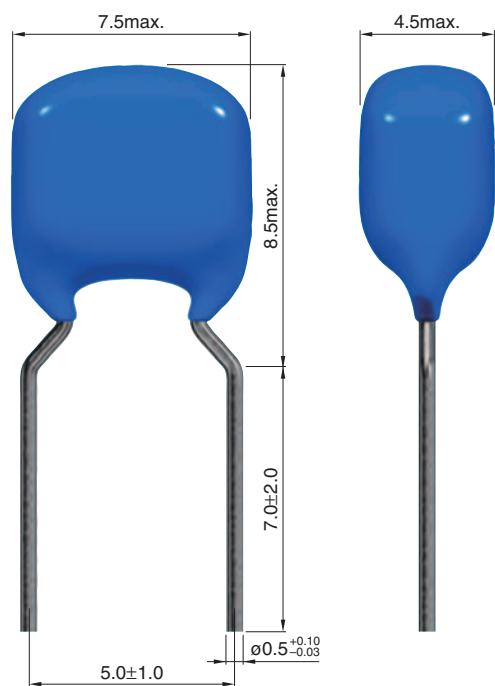
Temperature characteristics	Capacitance	Tolerance	Rated voltage Edc (V)	Part No.*
X8R	1.5uF	±10%	25	FA20X8R1E155KNU0□**
X8R	2.2uF	±10%	25	FA20X8R1E225KNU0□
X8R	3.3uF	±10%	25	FA20X8R1E335KNU0□
X8R	4.7uF	±10%	25	FA20X8R1E475KRU0□
X8R	470nF	±10%	100	FA20X8R2A474KRU0□
X8R	680nF	±10%	100	FA20X8R2A684KRU0□

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

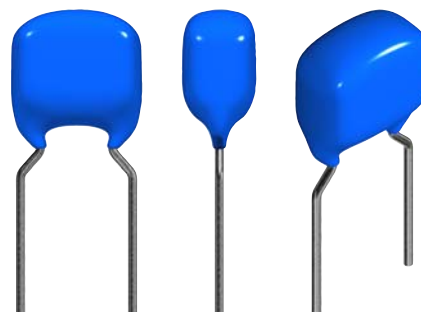
** The "□" of the Part Number contains the packaging symbol, 0 (Bulk packaging) or 6 (Taping packaging).

FA22 type

■ SHAPE & DIMENSIONS



Dimensions in mm



FA22 type

■ ELECTRICAL CHARACTERISTICS

□ CHARACTERISTICS SPECIFICATION TABLE

CLASS 1 (TEMPERATURE COMPENSATION)

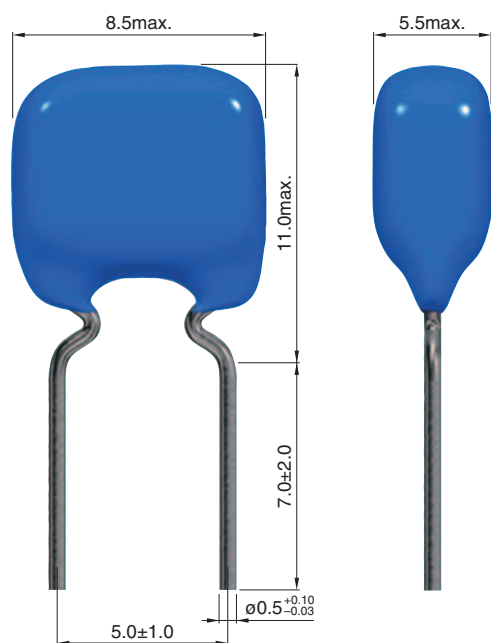
Temperature characteristics	Capacitance	Tolerance	Rated voltage Edc (V)	Part No.*
NP0	68nF	±5%	250	FA22NP02E683JRU0□**
NP0	100nF	±5%	250	FA22NP02E104JRU0□
NP0	47nF	±5%	450	FA22NP02W473JNU0□
NP0	68nF	±5%	450	FA22NP02W683JNU0□
NP0	47nF	±5%	630	FA22NP02J473JNU0□

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

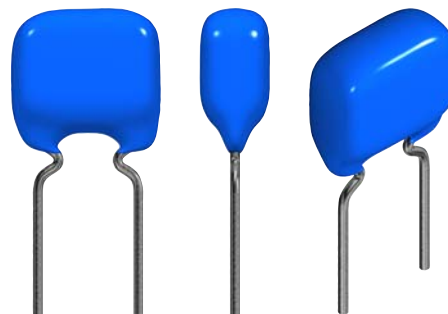
** The "□" of the Part Number contains the packaging symbol, 0 (Bulk packaging) or 6 (Taping packaging).

FA23 type

■ SHAPE & DIMENSIONS



Dimensions in mm



FA23 type

■ ELECTRICAL CHARACTERISTICS

□ CHARACTERISTICS SPECIFICATION TABLE

CLASS 1 (TEMPERATURE COMPENSATION)

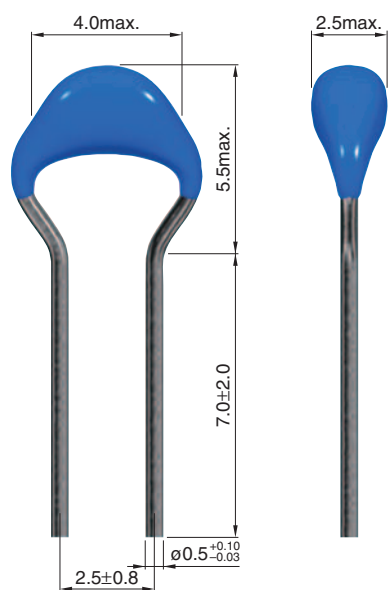
Temperature characteristics	Capacitance	Tolerance	Rated voltage Edc (V)	Part No.*
NPO	150nF	±5%	100	FA23NP02A154JNU0□**
NPO	150nF	±5%	250	FA23NP02E154JRU0□
NPO	100nF	±5%	450	FA23NP02W104JNU0□

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

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

FA18 type

■ SHAPE & DIMENSIONS



Dimensions in mm



FA18 type

ELECTRICAL CHARACTERISTICS

CHARACTERISTICS SPECIFICATION TABLE

CLASS 1 (TEMPERATURE COMPENSATION)

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

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

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

FA18 type

■ ELECTRICAL CHARACTERISTICS

□ CHARACTERISTICS SPECIFICATION TABLE

CLASS 2 (TEMPERATURE STABLE)

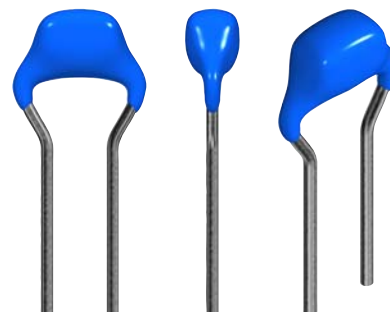
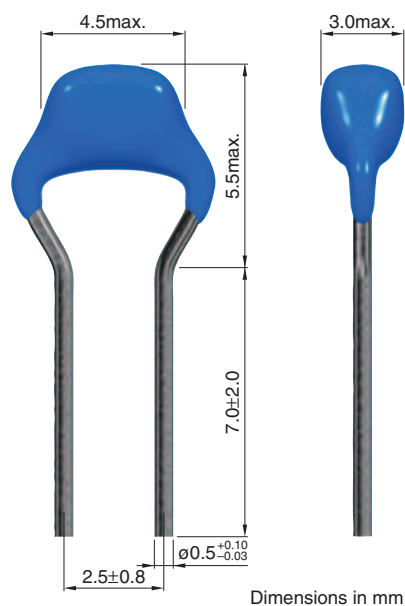
Temperature characteristics	Capacitance	Tolerance	Rated voltage Edc (V)	Part No.*
X8R	68nF	±10%	25	FA18X8R1E683KNU0□**
X8R	100nF	±10%	25	FA18X8R1E104KNU0□
X8R	150nF	±10%	25	FA18X8R1E154KRU0□
X8R	220nF	±10%	25	FA18X8R1E224KRU0□
X8R	1nF	±10%	50	FA18X8R1H102KNU0□
X8R	1.5nF	±10%	50	FA18X8R1H152KNU0□
X8R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

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

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

FA14 type

■ SHAPE & DIMENSIONS



FA14 type

ELECTRICAL CHARACTERISTICS

CHARACTERISTICS SPECIFICATION TABLE

CLASS 1 (TEMPERATURE COMPENSATION)

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

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

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

CLASS 2 (TEMPERATURE STABLE)

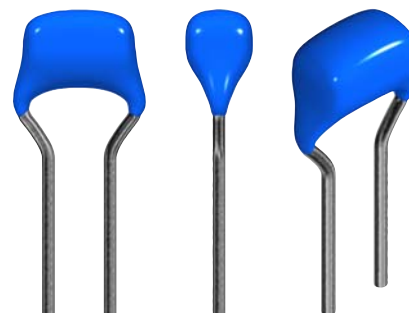
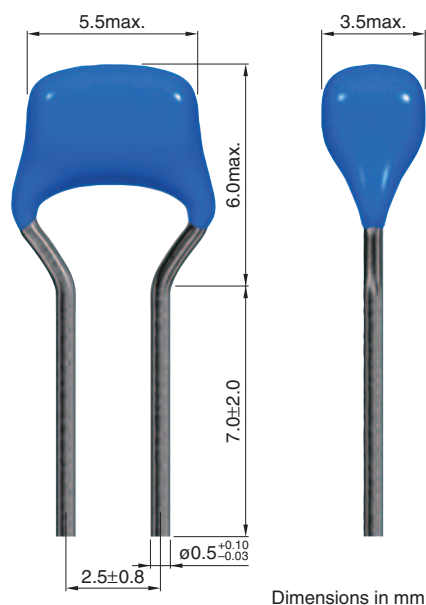
Temperature characteristics	Capacitance	Tolerance	Rated voltage Edc (V)	Part No.*
X8R	150nF	±10%	25	FA14X8R1E154KNU0□**
X8R	220nF	±10%	25	FA14X8R1E224KNU0□
X8R	330nF	±10%	25	FA14X8R1E334KNU0□
X8R	470nF	±10%	25	FA14X8R1E474KRU0□
X8R	68nF	±10%	50	FA14X8R1H683KNU0□
X8R	100nF	±10%	50	FA14X8R1H104KNU0□
X8R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

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

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

FA16 type

■ SHAPE & DIMENSIONS



FA16 type

ELECTRICAL CHARACTERISTICS

CHARACTERISTICS SPECIFICATION TABLE

CLASS 1 (TEMPERATURE COMPENSATION)

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

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

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

CLASS 2 (TEMPERATURE STABLE)

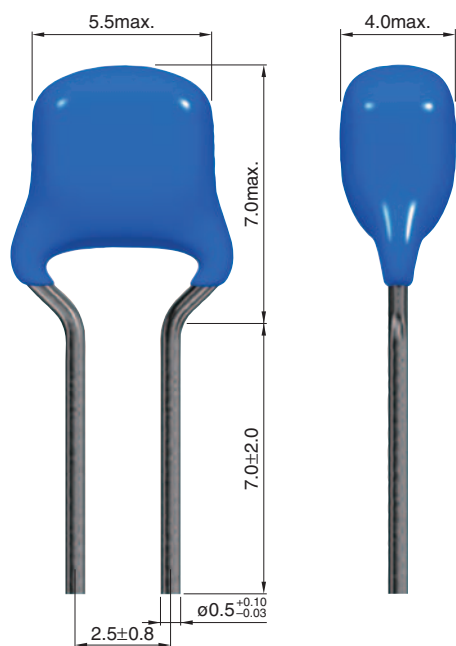
Temperature characteristics	Capacitance	Tolerance	Rated voltage Edc (V)	Part No.*
X8R	470nF	±10%	25	FA16X8R1E474KNU0□**
X8R	680nF	±10%	25	FA16X8R1E684KNU0□
X8R	1uF	±10%	25	FA16X8R1E105KNU0□
X8R	1.5uF	±10%	25	FA16X8R1E155KRU0□
X8R	2.2uF	±10%	25	FA16X8R1E225KRU0□
X8R	150nF	±10%	50	FA16X8R1H154KNU0□
X8R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

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

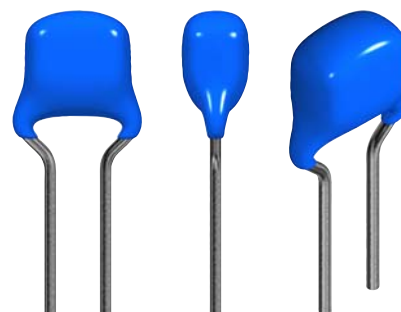
** The "□" of the Part Number contains the packaging symbol, 0 (Bulk packaging) or 6 (Taping packaging).

FA11 type

■ SHAPE & DIMENSIONS



Dimensions in mm



FA11 type

■ ELECTRICAL CHARACTERISTICS

□ CHARACTERISTICS SPECIFICATION TABLE

CLASS 1 (TEMPERATURE COMPENSATION)

Temperature characteristics	Capacitance	Tolerance	Rated voltage Edc (V)	Part No.*
NP0	68nF	±5%	100	FA11NP02A683JNU0□**

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

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

CLASS 2 (TEMPERATURE STABLE)

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

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

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

☐ **Lead pitch 5.0 mm**

The technical drawing illustrates a three-cylinder engine mechanism. The main front view shows three cylinders mounted on a common crankshaft. Key dimensions include:

- P_2 : Distance between the first and second cylinder centers.
- P : Distance between the second and third cylinder centers.
- P_1 : Distance from the crankshaft centerline to the cylinder centerline.
- H_0 : Height from the crankshaft centerline to the top of the cylinder.
- L_0 : Total length of the engine block.
- ℓ : Length of the crankshaft.
- F : Distance from the crankshaft centerline to the cylinder centerline.
- ϕd : Diameter of the crankshaft.
- ϕD : Diameter of the cylinder.
- W_0 , W_1 , W_2 , W_3 : Various vertical dimensions related to the cylinder and crankshaft assembly.

 The side view shows the crankshaft and the cylinder's profile. A detail view on the right shows a cross-section of the cylinder with a dimension Δh indicating a height difference.

*1 Accumulated pitch tolerance shall be $\pm 2\text{mm}$ 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.

*1 Accumulated pitch tolerance shall be $\pm 2\text{mm}$ 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.

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