

| CODIGO      | DESCRIPCION                       |
|-------------|-----------------------------------|
| Z5U-XXX-50V | Ceramico multicapa +/-20% 50V Z5U |

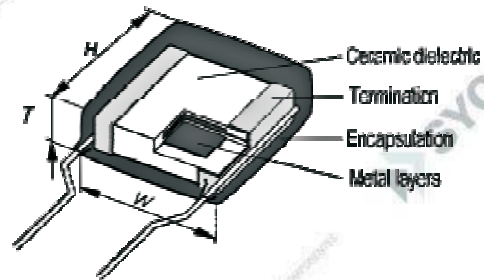
### Application

**NPO** : Temperature compensation type, have little or no change in capacitance with variation in temperature. Hence, they are used in radio-frequency oscillators, precision timing circuits, ultra stable amplifiers, etc.

**X7R** : Temperature stable type for by-pass and decoupling in radio and television receivers, computers servo systems, Audio tone, and coupling, etc., where moderate capacitance variations are permissible and dissipation factor is not critical.

**Z5U/Y5V** : General type for by-pass and filtering applications.

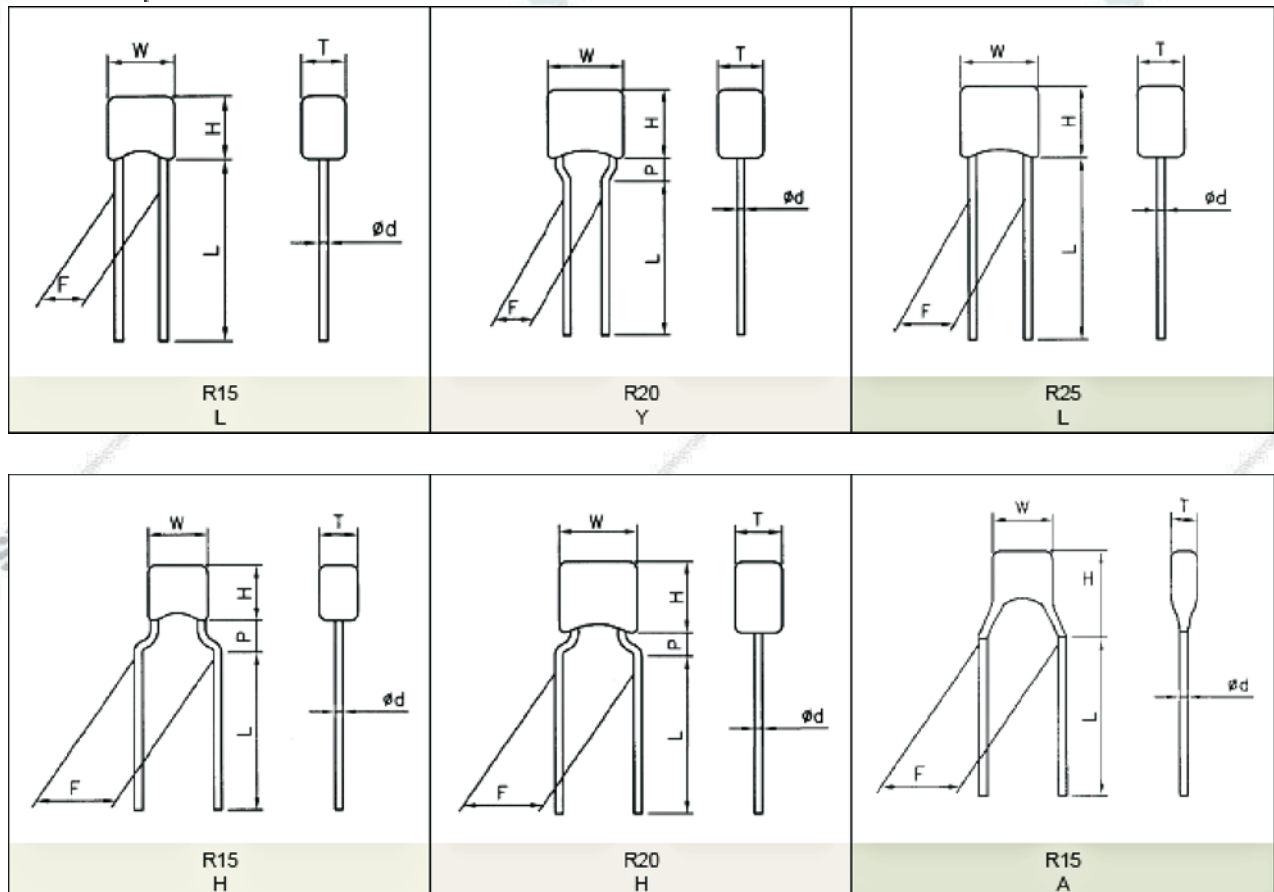
### Construction



### Part No. Designation

| R15  | Z              | 104  | M  | 1H  | L   | 5  | L  |
|------|----------------|--|--|---|---|--|--|
| SIZE | T.C            | Capacitance-Code                                     | Tolerance  | Voltage                                     | Lead shape                                | Lead shape   | Package-Lead-length  |
| R15  | N=NPO          | Two significant digits                               | A=±0.05PF<br>B=±0.10PF<br>C=±0.25PF<br>D=±0.50PF | F=±1%<br>G=±2%<br>J=±5%<br>K=±10%<br>M=±20% | 1C=16V 1E=25V<br>1H=50V 1J=63V<br>2A=100V | L=Straight<br>Y=Inside<br>Crimp<br>H=High<br>seated<br>A=Slope | 2=2.54±0.8<br>5=5.08±0.8<br>(mm)<br>6=6±1mm<br>L=25.4mm(min) |
| R20  | W=X7R          | +NO. of zeros.                                       |  |   |   |  |  |
| R25  | Z=Z5U<br>Y=Y5V | Example<br>102=1000pf<br>223=22000pf<br>104=100000pf | Z=+80/-20%                                       |   |   |  |  |

### 1. Lead Shape:



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### 2. Lead Space (F)

| Code | LEAD SPACE (mm/inch) |           |
|------|----------------------|-----------|
| 2    | 2.54±0.8             | 0.1±0.032 |
| 5    | 5.08±0.8             | 0.2±0.032 |

### 3. Lead Length (L)

| Code | LEAD LENGTH  | REMARK                |
|------|--------------|-----------------------|
| 6    | 6mm±1mm      | Specified lead length |
| L    | 25.4mm (min) | upon request.         |

### 4. Body Size & Dimension

| Size code | Capacitance Range           |                       |                         |                     | Lead style available | Dimensions (mm) |                |        |        |        |     |
|-----------|-----------------------------|-----------------------|-------------------------|---------------------|----------------------|-----------------|----------------|--------|--------|--------|-----|
|           | NPO                         | X7R                   | Z5U                     | Y5V                 |                      | H max           | W max          | T max. | d±0.05 | F±0.08 | P   |
| R15       | 50V:<br>0.47-4700pF         | 50V:<br>220pF-0.33uF  | 50V:<br>0.01uF - 0.22uF | 50V:<br>0.01-0.33uF | L                    | 3.8             | 3.8            | 2.5    | 0.5    | 2.54   | —   |
|           | 100V:<br>0.47-3900pF        | 100V:<br>220pF-0.1uF  |                         | 25V:<br>0.47-1.0uF  | H,A                  | 3.8             | H=3.8<br>A=5.0 | 2.5    | 0.5    | 5.08   | 2.0 |
| R20       | 25V:<br>12 - 47nF           | 25V:<br>1.0-10uF      | 50V:<br>0.22uF - 1.0uF  | 16V:<br>10-22uF     | Y                    | 5.0             | 6.0            | 3.0    | 0.5    | 2.54   | 2.0 |
|           | 50V:<br>2200pF-0.01uF       | 50V:<br>0.1-2.2uF     |                         | 25V:<br>2.2-4.7uF   | H                    | 5.0             | 6.0            | 3.0    | 0.5    | 5.08   | 2.0 |
|           | 100V:<br>1nF - 0.01uF       | 100V:<br>0.1-1.0uF    |                         | 50V:<br>0.47-2.2uF  |                      |                 |                |        |        |        |     |
| R25       | 25V: 0.1uF                  | 100V:<br>0.22 - 2.2uF | 100V:<br>0.47uF - 2.2uF | 16V: 47uF           | L                    | 6.5             | 6.5            | 4.0    | 0.5    | 5.08   | —   |
|           | 50V & 100V<br>0.012-0.033uF |                       |                         | 25V: 22uF           |                      |                 |                |        |        |        |     |
|           |                             |                       |                         | 50V: 10uF           |                      |                 |                |        |        |        |     |

## Typical Performance Characteristics

### Specifications

#### Temperature coefficient

- NPO: ± 30PPM/°C, -55°C to +125°C
- X7R: ± 15%, -55°C to +125°C
- Z5U: +22%,-56%, +10°C to +85°C
- Y5V: +22%, -82%, -30°C to +85°C

#### Capacitance test 25°C

- NPO: 1 VRMS max at 1 KHz (1 MHz for 100pF or less)
- X7R: 1 VRMS max at 1 KHz
- Z5U: 1 VRMS max at 1 KHz
- Y5V: 1 VRMS max at 1 KHz

#### Dissipation Factor 25°C (see exception at last page)

NPO: 0.15% max at 1KHz, 1VRMS max  
(1 MHz for 1000pF or less)

Z5U: 5% max (at 1KHz, 1VRMS max)

| X7R: (at 1KHz, 1VRMS max) |               | Y5V: (at 1KHz, 1VRMS max) |               |
|---------------------------|---------------|---------------------------|---------------|
| Max                       | Rated voltage | Max                       | Rated voltage |
| 2.5%                      | ≥50V          | 5%                        | ≥50V          |
| 3.5%                      | 25V & 16V     | 7%                        | 25V & 16V     |
| 5.0%                      | 10V & 6.3V    | 10%                       | 10V & 6.3V    |

#### Dielectric strength 25°C (Flash Test)

- NPO and X7R: 300% rated voltage for 5 seconds with 50 mA, max charging current.
- Z5U and Y5V: 250% rated voltage for 5 seconds with 50 mA, max charging current.

#### LifeTest :

(1000 hrs at max temp, applied with Flash test voltage  
Recovery: 6-24 hrs for NPO and 24± 2 hrs for X7R & Z5U )

- NPO: ≯ ±3% at 200% rated voltage, 125°C
- X7R: ≯ ±3% at 200% rated voltage, 125°C
- Z5U: ≯ ±3% at 200% rated voltage, 85°C
- Y5V: ≯ ±3% at 200% rated voltage, 85°C

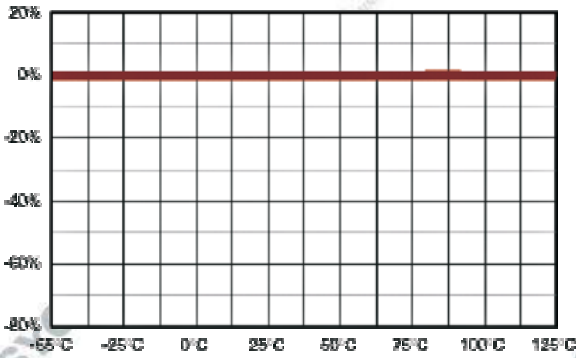
Insulation Resistance after 60 sec., charging at rated voltage, 25°C, 55% R.H. max

- NPO: 100GΩ or 1000MΩ-uF whichever is less
- X7R : 10GΩ or 100MΩ-uF whichever is less
- Z5U : 10GΩ or 100MΩ-uF whichever is less
- Y5V : 10GΩ or 1000MΩ-uF whichever is less

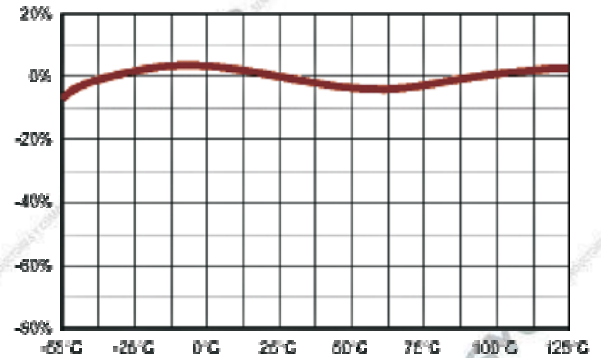
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**Temperature Charactersitcs Specifications**

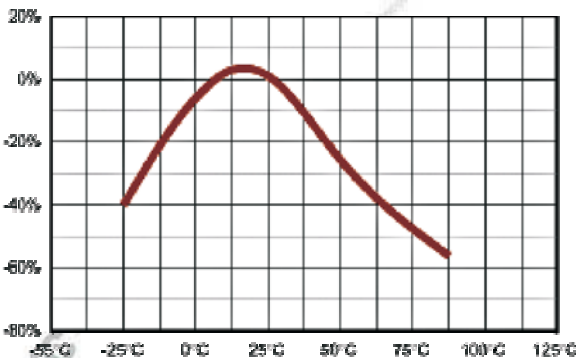
**NPO CAP. VS TEMPERATURE**



**X7R CAP. VS TEMPERATURE**



**Z5U CAP. VS TEMPERATURE**



**Y5V CAP. VS TEMPERATURE**

