

Microwave Dielectric Resonators

I. Applications

Mainly used in dielectric filters to generate resonant frequency.

II. Features

- high quality factor;
- Excellent temperature stability;
- High dimensional accuracy;
- High resonant-frequency accuracy.



III. Part Numbering Rules

DR – A421 – 2213 – D2R3 – A – T2R3 – B
① ② ③ ④ ⑤ ⑥ ⑦

① indicates product type: microwave dielectric resonator.

② indicates material class.

Material Code	Dielectric Constant	Q	Qf (GHz)	Frequency Temperature Coefficient (ppm/°C)
A410	17~18	3700@6GHz	22200	-5~-4
A411	21~22	8000@8GHz	64000	+2~+3
A412	24~25	4700@5GHz	23500	-1~+1
A413	30~31	3700@5GHz	18500	+5~+6
A421	40~41	1900@10GHz	19000	+5~+6
A422	39~40	1900@10GHz	19000	-1~0
A423	38~39	2000@10GHz	20000	+2~+3

③ indicates resonant frequency: the first two digits represent the integer part and the last two digits represent the decimal part. For example: 2213=22.13 GHz; 0901=9.01 GHz.

④ indicates product diameter: the first letter D represents diameter; the following 2-3 characters represent the nominal value; the last digit indicates the number of zeros; R indicates the decimal-point position. For example: D120=12.0 mm; D101=100.0 mm; D1R2=1.2 mm; DR10=0.10 mm.

⑤ indicates diameter tolerance: A=±2%; B=±5%.

⑥ indicates thickness: the first letter T represents thickness; the following 2-3 characters represent the nominal value; the last digit indicates the number of zeros; R indicates the decimal-point position. For example: T120=12.0 mm; T101=100.0 mm; T5R2=5.2 mm; TR10=0.10 mm.

⑦ indicates thickness tolerance: A=±2%; B=±5%.

Appendix: capacitor 2011years~2018years naming rules

1. general-purpose type single-layer capacitor naming rules

SG - 15 - 1 - E - 1R0 - B - N - T - W
① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

① indicates product type: SG indicates general-purpose type single-layer capacitor.

② indicates product dimensions: see the size code table.

③ indicates rated voltage: B=16 V; 2=25 V; 5=50 V; 6=63 V; 1=100 V.

④ indicates dielectric class: see the dielectric code table.

⑤ indicates standard capacitance: the first two digits represent the nominal capacitance value, and the third digit indicates the number of zeros. For example: R05=0.05 pF; 2R0=2.0 pF; 220=22 pF; 101=100 pF; 102=1000 pF.

⑥ indicates capacitance tolerance: A: ± 0.05 pF; B: ± 0.1 pF; C: ± 0.25 pF; D: ± 0.5 pF; F: $\pm 1.0\%$; G: $\pm 2.0\%$; J: $\pm 5.0\%$; K: $\pm 10\%$; L: $\pm 15\%$; M: $\pm 20\%$; S: $-20\%\sim +50\%$; Z: $-20\%\sim +80\%$.

⑦ indicates product outline: N indicates no-margin type; S indicates single-side-margin type; D indicates double-side-margin type.

⑧ indicates electrode material: T represents TiW/Ni/Au terminals; N represents TiW/Au terminals; S represents special requirements.

⑨ indicates packaging method: W represents anti-static chip-box packaging; C represents special packaging.

2. array type single-layer ceramic capacitor naming rules

SA - 15 - 1 - F - 1R0 - B - 3 - T - W
① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

① indicates product type: array-type single-layer capacitor.

② indicates product dimensions: see the size code table.

③ indicates rated voltage: B=16V; 2=25V; 5=50V; 6=63V; 1=100V.

④ indicates quality Class: see the dielectric code table.

⑤ indicates standard capacitance: the first two digits represent the nominal capacitance value, and the third digit indicates the number of zeros. For example: R05=0.05 pF; 2R0=2.0 pF; 220=22 pF; 101=100 pF; 102=1000 pF.

⑥ indicates capacitance tolerance: A: ± 0.05 pF; B: ± 0.1 pF; C: ± 0.25 pF; D: ± 0.5 pF; F: $\pm 1.0\%$; G: $\pm 2.0\%$; J: $\pm 5.0\%$; K: $\pm 10\%$; L: $\pm 15\%$; M: $\pm 20\%$; S: $-20\%\sim +50\%$; Z: $-20\%\sim +80\%$.

⑦ indicates number of electrodes: 3 indicates 3 electrodes; 4 indicates 4 electrodes; 5 indicates 5 electrodes; 6 indicates 6 electrodes.

⑧ indicates electrode material: T represents TiW/Ni/Au terminals; N represents TiW/Au terminals; S represents special requirements.

⑨ indicates packaging method: W represents anti-static chip-box packaging; C represents special packaging.

3. multi-electrode type single-layer capacitor naming rules

SP - 15 - 1 - F - 1R0 - B - 3 - T - W
① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

① indicates product type: multi-electrode single-layer capacitor.

② indicates product dimensions: see the size code table.

③ indicates rated voltage: B=16V; 2=25V; 5=50V; 6=63V; 1=100V.

④ indicates quality Class: see the dielectric code table.

⑤ indicates nominal capacitance: the first two digits represent the nominal capacitance value, and the third digit indicates the number of zeros. For example: R05=0.05 pF; 2R0=2.0 pF; 220=22 pF; 101=100 pF. The nominal capacitance in the model refers to the nominal capacitance of the smallest electrode.

⑥ indicates capacitance tolerance: A: ± 0.05 pF; B: ± 0.1 pF; C: ± 0.25 pF; D: ± 0.5 pF; F: $\pm 1.0\%$; G: $\pm 2.0\%$; J: $\pm 5.0\%$; K: $\pm 10\%$; L: $\pm 15\%$; M: $\pm 20\%$; S: $-20\% \sim +50\%$; Z: $-20\% \sim +80\%$.

⑦ indicates number of electrodes: 3 indicates 3 electrodes; 4 indicates 4 electrodes; 5 indicates 5 electrodes; 6 indicates 6 electrodes.

⑧ indicates electrode material: T represents TiW/Ni/Au terminals; N represents TiW/Au terminals; S represents special requirements.

⑨ indicates packaging method: W represents anti-static chip-box packaging; C represents special package assembly.

4. high-voltage, high-capacitance microwave ceramic chip capacitor

CT91 - 90 - 2X - 103 - M - 50 - T - W
① ② ③ ④ ⑤ ⑥ ⑦ ⑧

① indicates product type: high-voltage high-capacitance microwave ceramic chip capacitor.

② indicates product dimensions.

③ indicates temperature characteristic: 2X = X7R ($-55 \sim +125^\circ\text{C}$, $\text{TCC} \leq \pm 15\%$); 2C = X7S ($-55 \sim +125^\circ\text{C}$, $\text{TCC} \leq \pm 22\%$).

④ indicates standard capacitance: the first two digits represent the nominal capacitance value, and the third digit indicates the number of zeros. For example: R05=0.05 pF; 2R0=2.0 pF; 220=22 pF; 101=100 pF; 102=1000 pF.

⑤ indicates capacitance tolerance: J: $\pm 5.0\%$; K: $\pm 10\%$; L: $\pm 15\%$; M: $\pm 20\%$; S: $-20\% \sim +50\%$; Z: $-20\% \sim +80\%$.

⑥ indicates rated voltage: 50=50 V; 100=100 V.

⑦ indicates electrode material: T represents TiW/Ni/Au; C represents Cu/Ni/Au.

⑧ indicates packaging method: W represents anti-static chip-box packaging; C represents special packaging.