RF Capacitors

High-Q Porcelain P90 Capacitors - QP Series

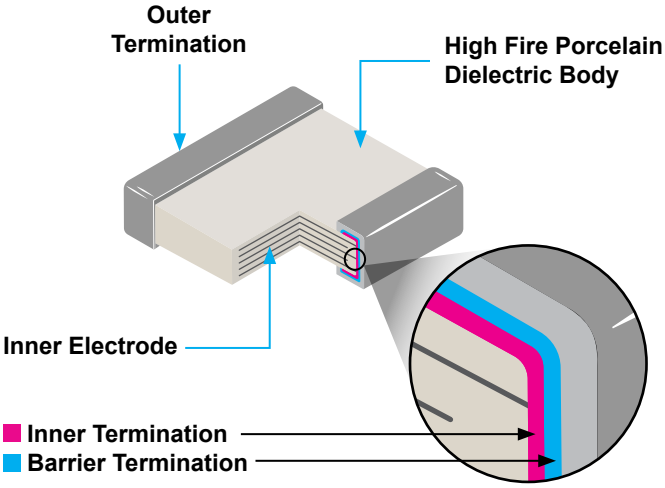
Features:

- Non-Magnetic Construction
- High Fire Porcelain Dielectric Body
- Highly Reliable Low Loss Performance
- EIA Case Sizes: 1111, 2525, 3838 and 7676
- Low Frequency Power Handling Performance: <100MHZ
- Tape & Reel for Surface Mount Assembly 7” Reels Standard
- External Termination Layer on Chip: 100% Sn Standard (RoHS) and SnPb Optional
- Enhanced High-Q / Low Loss P90 – Lower Loss Than Standard NP0
- P90 Temperature Coefficient: -55°C to +150°C (-65°F to +302°F)
- Controlled Series Resonant Frequencies and Parallel Resonant Frequencies (SRF/PRF)

Common Applications:

- RF Matching and Filter Networks
- High Inductance Environments
- Decoupling, Bypass, and DC Block
- Cellular Base Station Equipment
- RF and Microwave Test Equipment
- MRI Coil Matching
- Broadband Wireless Equipment
- High Voltage RF Requirements
- High Power Radio and Radar
- Plasma Generator Equipment
- High Voltage RF Resonant Circuits

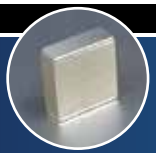
Basic Construction



Advantages of a Low Loss Capacitor:

- Increased power output and higher efficiency from RF power amplifiers
- Reduced amount of heat generated through ultra-low ESR / High-Q
- Signal to noise ratio and overall noise temperature can be improved by lower losses
- Lower in-band insertion loss (S21) when used in filter networks
- Lower resistivity through the heat generation plane to transfer heat allowing higher power dissipation

RESOURCE ▶ https://www.johansontechnology.com/products/high-q-porcelain-p90-capacitors/



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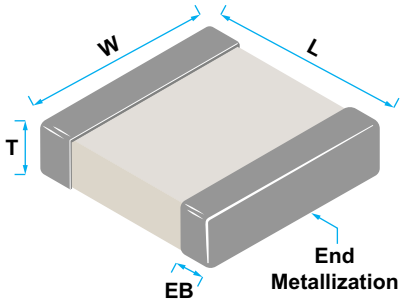
External Capacitor Dimensions

Size Code	Units	Length "L"	Width "W"	Thickness "T"	End Band "EB"	Mechanical Characteristics
1111 DB	In	.110+.020 -.010	0.110±.010	0.100 max.	0.024 max	
	mm	2.79 +0.51 -0.25	2.79±0.25	2.54 max.	.61 max	
2525 EV	In	.225+.025 - .010	0.250±.015	0.150 max.	0.020 to 0.047	
	mm	5.72 +0.64 -0.25	6.35±0.38	3.81 max.	0.51 to 1.19	
3838 FM	In	.380+.015 -.010	0.380±.010	0.170 max.	0.024 to 0.059	
	mm	9.65 +0.38 -0.25	9.65±0.25	4.32 max.	0.61 to 1.50	
7676 KG	In	0.760 ± 0.015 - 0.010	0.760± 0.010	0.197 max	0.024 to 0.059	
	mm	19.3 + 0.28 to 0.25	19.3 0.25	5.00 max	0.60 ± 1.50	



Electrical Characteristics

Characteristics	Test Parameters
Dielectric Strength	Ultra-Low Loss, High-Q NP0
Rated Voltage (VDC)	200 to 8000 Volts DC (See List Below)
Capacitance Range (EIA)	0.2 to 20000 pF (See List Below)
Capacitance Tolerance	A, B, C, D, F, G, J, K
Test Parameters	1 MHz ± 50 kHz @ 1.0 ± 0.2 VRMS, 25°C for <1000pF 1 kHz ± 50 kHz @ 1.0 ± 0.2 VRMS, 25°C for >1000pF
Temperature Coefficient	P90 -55° to 125°C +90ppm +/- 20ppm P90 125° to 200°C +90ppm +/- 30ppm
Dissipation Factor	0.1% maximum
Quality Factor	Q > 1,000 @ 1 MHz 50 kHz, 25°C, 1.0 VRMS for cap < 1000pF Q > 1,000 @ 1 kHz 50 Hz, 25°C, 1.0 VRMS for cap > 1000pF Typically, greater than 10,000
Insulation Resistance	> 100 GΩ minimum at 25°C, Test Voltage 500V >10 GΩ @ 125°C, Test Voltage 500V
Operating Environment Range	-55° to +200°C
Storage Post Assembly Non-Operating	-65° to 200°C
Storage Environment in packaging	Tape & Reeled: 5 to 40 C & 20% to 70% RH
Breakdown Voltage (DWV)	250% of Rated Voltage for 5 sec for rated voltage <500V 150% of Rated Voltage for 5 sec for 500V < rated voltage <1250V 120% of Rated Voltage for 5 sec for rated voltage > 1250V

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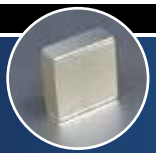
Capacitance and Voltage Range

Case Size / EIA (Metric)	Standard Capacitance and Rated Voltages (0.2 pF to 7.5 pF)																																						
	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.4	2.7	3.0	3.3	3.6	3.9	4.3	4.7	5.1	5.6	6.2	6.8	7.5
1111 (2828)	1500V																																						
2525 (6464)				3600V																																					
3838 (9696)					7200V																																				
7676 (193193)																														8000V										

Case Size / EIA (Metric)	Standard Capacitance and Rated Voltages (8.2 pF to 100 pF)																																						
	8.2	9.1	10	11	12	13	14	15	16	18	20	22	24	27	30	33	36	39	43	47	51	56	62	68	75	82	91	100											
1111 (2828)	1500V																																						
2525 (6464)	3600V																																						
3838 (9696)	7200V																																						
7676 (193193)	8000V																																						

Case Size / EIA (Metric)	Standard Capacitance and Rated Voltages (110 pF to 1200 pF)																																						
	110	120	130	140	150	160	180	200	220	240	270	300	360	390	430	470	510	560	620	680	750	820	910	1000	1200														
1111 (2828)	1000V								600V								200V																						
2525 (6464)	3000V											2000V					1500V																						
3838 (9696)	7200V							3600V						2500V										1000V															
7676 (193193)	8000V											5000V																											



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Capacitance and Voltage Range

Caes Size / EIA (Metric)	Standard Capacitance and Rated Voltages (1500 pF to 20000 pF)																			
	1500	1800	2200	2400	2700	3300	3900	4700	5100	5600	6200	6800	7500	8200	9100	10000	12000	15000	18000	20000
1111 (2828)																				
2525 (6464)	500V																			
3838 (9696)	1000V				500V															
7676 (193193)	5000V											3000V					2000V			

HOW TO ORDER

QP	DB	152	9	1R0	J	1	GU	001	E
Subfamily	**Size**	**Voltage**	**DTC**	**Capacitance**	**Tolerance**	**Mark**	**Termination**	**Special Code**	**Pack**
QP = High-Q P Series	**DB** = 1111 **EV** = 2525 **FM** = 3838 **KG** = 7676	**201** = 200V **501** = 500V **601** = 600V **102** = 1000V **152** = 1500V **202** = 2000V **252** = 2500V **362** = 3600V **502** = 5000V **722** = 7200V **802** = 8000V **ZZZ** = Special Code	**9** = Hi-Q P90	1st two digits are significant; 3rd digit denotes number of zeros. **1R0** = 1 pF **150** = 15 pF **472** = 4,700 pF + Alpha Cap Codes **ZZZ** = Special Code	**<10pF** **T** = ±0.02pF **A** = ±0.05pF **B** = ±0.1pF **C** = ±0.25pF **D** = ±0.5pF **≥10pF** **F** = ±1% **G** = ±2% **H** = ±3% **J** = ±5% **K** = ±10% **Z** = Special Code	**1** = No Mark **2** = EIA Mark **3** = Cap Code & Tol **Z** = Special Code	**Non-Mag**[1] **GU** = Cu/Sn (RoHS) **NC** = Cu/SnPb **GV** = Ni/Sn (RoHS) **NT** = Ni/SnPb **Leaded** **AR** = Axial Wire Lead (Ni/Sn RoHS) **AN** = Axial Wire Lead (Ni/SnPb) **A2** = Axial Ribbon Lead **M1** = Microstrip Lead **M2** = Microstrip Lead - Short **R1** = Radial Wire (Ni/Sn RoHS) **RR** = Radial Wire (Ni/SnPb) **RN** = Radial Wire (Ni/Sn/PB)	**001** = Default catalog item **003** = 1st Special Code	**B** = Bulk **C** = Non-Conductive Bags **W** = Waffle Pack **Embossed Tape** **K** = 5" Reel Emb Tape **E** = 7" Reel Emb Tape **U** = 13" Reel Emb Tape

Example: QPDB15291R0J1GU001E Capacitors High-Q MLC P-Series, 1111, H1500V, Hi-Q P90, 1pF, ±5%, No Mark, Cu/Sn (RoHS), Default catalog item, 7" Reel Embossed Tape