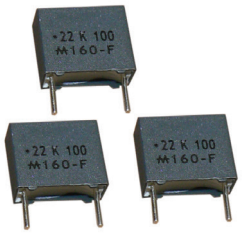
Type 160 Metallized Polyester Radial Lead Capacitors

Radial Box Metallized Polyester Capacitors



The Type 160 series radial lead metallized polyester box capacitors are constructed in rugged rectangular plastic cases with lead spacings that are standard in the electronics industry. All Type 160 capacitors are available in bulk with a .217" ±.039" lead length, and they are good for general purpose applications such as bypass, decoupling, energy storage/discharge and arc suppression.

Highlights

- RoHS compliant
- Rugged plastic case
- Case and epoxy fill meets UL94V0
- 10 mm through 27.5 mm lead spacings
- Non-inductively wound
- Non-polar
- Wire lead material, tinned copper clad steel

RoHS Compliant

Specifications

Capacitance Range: 0.0022 µF to 10.0 µF

Voltage Range: 63 Vdc to 1000 Vdc

Capacitance Tolerance: ±5%, ±10%, ±20%

Operating Temperature Range: –55 °C to +125 °C (derating voltage to 1.25% per °C above 85 °C)

Dielectric Withstand Voltage: 1.6 x rated voltage for 2 sec @ +25 °C ±5 °C

Dissipation Factor (DF): tanδ x 10^{-4} at 25 °C ±5 °C

kHz	C ≤1 µF	C >1 µF
1	≤100	≤100
10	≥150	

Total Self Inductance (L):

Pitch (mm)	10	15	22.5	27.5
L (nH) ≈	9	10	18	18

Long Term Stability (after two years): Capacitance change ΔC/C ≤ ±3% under standard environmental conditions

Corona (Partial Discharge Inception Voltage):
200 Vac for 100 Vdc, 200 Vdc
250 Vac for 400 Vdc, 630 Vdc
300 Vac for 1000 Vdc

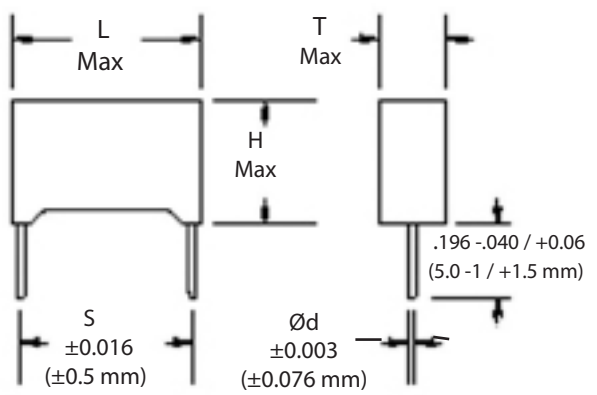
Maximum Pulse Rise Time (dv/dt):

	Pitch (mm)			
Vn	10	15	22.5	27.5
63	3	1.5	1	1
100/160	6/8	3	2	1
250	11	7	4	3
400	20	10	5.5	5
630	30	15	8	7
1000	60	25	15	10

If the working voltage (V) is less than the nominal voltage (Vn), the capacitor can work at higher dv/dt. In this case, the maximum value allowed is obtained by multiplying the above value with the ratio Vn/V.

Type 160 Metallized Polyester Radial Lead Capacitors

Capacitor Outline Drawing



Note: The lead diameter is a maximum dimension for lead spacing ≤15 mm and a nominal for lead spacing >15 mm

Test Method and Performance

Insulation Resistance	
Test Conditions	
Temperature	25 °C ±5 °C
Voltage Charge Time	1 minute
Voltage Charge	50 Vdc for Vn < 100 Vdc
	100 Vdc for Vn ≥ 100 Vdc
Performance	
For Vn > 100 Vdc	≥30,000 MΩ for ≤ 0.33µF
	≥10,000 MΩ x µF for C > 0.33µF
For Vn ≤100 Vdc	≥10,000 MΩ for C ≤ 0.1µF
	≥1,000 MΩ x µF for ≤ 0.1µF

Damp Heat Test	
Test Conditions	
Temperature	+40 °C
Relative Humidity	95%
Test Duration	21 days
Performance	
Capacitance Change ΔC/C	≤ ±5%
DF Change Δtgδ	≤50 x 10^{4} at 1 kHz
Insulation Resistance	≥ 50% of limit value

Soldering	
Test Conditions	
Soldering Temperature	260 °C ±5 °C
Soldering Duration	10 sec ±1 sec
Performance	
Capacitance Change ΔC/C	≤ ±2%
DF Change Δtgδ	≤30 x 10^{-4} at 10 kHz for C ≤1.0 µF
	≤20 x 10^{-4} at 1 kHz for C >1.0 µF

Life Test	
Test Conditions	
Temperature	+85 °C
Test Duration	1000 hrs
Voltage Applied	1.25 x Vn
Performance	
Capacitance Change ΔC/C	≤ ±5%
DF Change Δtgδ	≤30 x 10^{-4} at 10 kHz for C ≤1.0 µF
	≤20 x 10^{-4} at 1 kHz for C >1.0 µF
Insulation Resistance	≥ 50% of limit value

Ratings — RoHS Compliant

Cap (µF)	Catalog Part Number	Inches					Millimeters				
		L	T	H	S	Ød	L	T	H	S	Ød
	63 Vdc										
.22	160224*63D–F	0.512	0.157	0.374	0.394	0.031	13.0	5.0	11.0	10.0	0.8
.27	160274*63D–F	0.512	0.157	0.374	0.394	0.031	13.0	5.0	11.0	10.0	0.8
.33	160334*63E–F	0.512	0.157	0.374	0.394	0.031	13.0	6.0	12.0	10.0	0.8
.39	160394*63E–F	0.512	0.157	0.374	0.394	0.031	13.0	6.0	12.0	10.0	0.8
.47	160474*63E–F	0.512	0.197	0.433	0.394	0.031	13.0	6.0	12.0	10.0	0.8
.56	160564*63D–F	0.512	0.197	0.433	0.394	0.031	13.0	5.0	11.0	10.0	0.8
.68	160684*63D–F	0.512	0.197	0.433	0.394	0.031	13.0	5.0	11.0	10.0	0.8
.68	160684*63G–F	0.709	0.236	0.472	0.591	0.031	18.0	6.0	12.0	15.0	0.8
.82	160824*63E–F	0.512	0.236	0.472	0.394	0.031	13.0	6.0	12.0	10.0	0.8
.82	160824*63H–F	0.709	0.197	0.433	0.591	0.031	18.0	7.5	13.5	15.0	0.8
1.0	160105*63H–F	0.709	0.197	0.433	0.591	0.031	18.0	7.5	13.5	15.0	0.8
1.5	160155*63G–F	0.709	0.236	0.472	0.591	0.031	18.0	6.0	12.5	15.0	0.8
2.2	160225*63H–F	0.709	0.295	0.531	0.591	0.031	18.0	7.5	14.0	15.0	0.8
3.3	160335*63M–F	1.043	0.276	0.650	0.886	0.031	18.0	10.0	16.0	15.0	0.8
4.7	160475*63N–F	1.043	0.335	0.669	0.886	0.031	26.5	8.5	17.0	22.5	0.8
6.8	160685*63O–F	1.043	0.394	0.748	0.886	0.031	26.5	10.0	19.0	22.5	0.8
10.0	160106*63P–F	1.260	0.433	0.787	1.083	0.031	26.5	13.0	23.0	22.5	0.8

* Indicates capacitance tolerance: J = ±5%, K = ±10%, M = ±20%

Type 160 Metallized Polyester Radial Lead Capacitors

RoHS Compliant

Cap (µF)	Catalog Part Number	Inches					Millimeters				
		L	T	H	S	Ød	L	T	H	S	Ød
100 Vdc											
.10	160104*100C–F	0.512	0.157	0.374	0.394	0.031	13.0	4.0	9.5	10.0	0.8
.12	160124*100C–F	0.512	0.157	0.374	0.394	0.031	13.0	4.0	9.5	10.0	0.8
.15	160154*100C–F	0.512	0.157	0.374	0.394	0.031	13.0	4.0	9.5	10.0	0.8
.18	160184*100C–F	0.512	0.157	0.374	0.394	0.031	13.0	4.0	9.5	10.0	0.8
.22	160224*100D–F	0.512	0.197	0.433	0.394	0.031	13.0	5.0	11.0	10.0	0.8
.27	160274*100D–F	0.512	0.197	0.433	0.394	0.031	13.0	5.0	11.0	10.0	0.8
.33	160334*100E–F	0.512	0.236	0.472	0.394	0.031	13.0	6.0	12.0	10.0	0.8
.33	160334*100F–F	0.709	0.197	0.433	0.591	0.031	18.0	5.0	11.0	15.0	0.8
.39	160394*100E–F	0.512	0.236	0.472	0.394	0.031	13.0	6.0	12.0	10.0	0.8
.39	160394*100F–F	0.709	0.197	0.433	0.591	0.031	18.0	5.0	11.0	15.0	0.8
.47	160474*100E–F	0.512	0.236	0.472	0.394	0.031	13.0	6.0	12.0	10.0	0.8
.47	160474*100F–F	0.709	0.197	0.433	0.591	0.031	18.0	5.0	11.0	15.0	0.8
.56	160564*100G–F	0.709	0.236	0.472	0.591	0.031	18.0	6.0	12.0	15.0	0.8
.68	160684*100G–F	0.709	0.236	0.472	0.591	0.031	18.0	6.0	12.0	15.0	0.8
.82	160824*100H–F	0.709	0.295	0.531	0.591	0.031	18.0	7.5	13.5	15.0	0.8
1.0	160105*100H–F	0.709	0.295	0.531	0.591	0.031	18.0	7.5	13.5	15.0	0.8
1.5	160155*100M–F	1.043	0.276	0.650	0.886	0.031	26.5	7.0	16.5	22.5	0.8
2.2	160225*100N–F	1.043	0.335	0.669	0.886	0.031	26.5	8.5	17.0	22.5	0.8
3.3	160335*100O–F	1.043	0.394	0.748	0.886	0.031	26.5	10.0	19.0	22.5	0.8
4.7	160475*100P–F	1.260	0.433	0.787	1.083	0.031	32.0	11.0	20.0	27.5	0.8
6.8	160685*100Q–F	1.260	0.512	0.886	1.083	0.031	32.0	13.0	22.5	27.5	0.8
10.0	160106*100S–F	1.457	0.709	1.299	1.083	0.031	37.0	18.0	33.0	27.5	0.8
160 Vdc											
.10	160104*160C–F	0.512	0.157	0.374	0.394	0.031	13.0	4.0	9.5	10.0	0.8
250 Vdc											
.033	160333*250C–F	0.512	0.157	0.374	0.394	0.031	13.0	4.0	9.5	10.0	0.8
.039	160393*250C–F	0.512	0.157	0.374	0.394	0.031	13.0	4.0	9.5	10.0	0.8
.047	160473*250C–F	0.512	0.157	0.374	0.394	0.031	13.0	4.0	9.5	10.0	0.8
.056	160563*250C–F	0.512	0.157	0.374	0.394	0.031	13.0	4.0	9.5	10.0	0.8
.068	160683*250C–F	0.512	0.157	0.374	0.394	0.031	13.0	4.0	9.5	10.0	0.8
.082	160823*250D–F	0.512	0.197	0.433	0.394	0.031	13.0	5.0	11.0	10.0	0.8
.10	160104*250D–F	0.512	0.197	0.433	0.394	0.031	13.0	5.0	11.0	10.0	0.8
.10	160104*250F–F	0.709	0.197	0.433	0.591	0.031	18.0	5.0	11.0	15.0	0.8
.12	160124*250D–F	0.512	0.236	0.472	0.394	0.031	13.0	6.0	12.0	10.0	0.8
.12	160124*250F–F	0.709	0.197	0.433	0.591	0.031	18.0	5.0	11.0	15.0	0.8
.15	160154*250E–F	0.512	0.236	0.472	0.394	0.031	13.0	6.0	12.0	10.0	0.8
.15	160154*250F–F	0.709	0.197	0.433	0.591	0.031	18.0	5.0	11.0	15.0	0.8
.18	160184*250E–F	0.512	0.236	0.472	0.394	0.031	13.0	6.0	12.0	10.0	0.8
.18	160184*250F–F	0.709	0.197	0.433	0.591	0.031	18.0	5.0	11.0	15.0	0.8
.22	160224*250F–F	0.709	0.197	0.433	0.591	0.031	18.0	5.0	11.0	15.0	0.8
.27	160274*250G–F	0.709	0.236	0.472	0.591	0.031	18.0	6.0	12.0	15.0	0.8
.33	160334*250G–F	0.709	0.236	0.472	0.591	0.031	18.0	6.0	12.0	15.0	0.8
.39	160394*250H–F	0.709	0.295	0.531	0.591	0.031	18.0	7.5	13.5	15.0	0.8
.47	160474*250H–F	0.709	0.295	0.531	0.591	0.031	18.0	7.5	13.5	15.0	0.8
.47	160474*250L–F	1.043	0.236	0.591	0.886	0.031	26.5	6.0	15.0	22.5	0.8
.56	160564*250I–F	0.709	0.335	0.571	0.591	0.031	18.0	8.5	14.5	15.0	0.8
.56	160564*250M–F	1.043	0.276	0.650	0.886	0.031	26.5	7.0	16.5	22.5	0.8
.68	160684*250I–F	0.709	0.335	0.571	0.591	0.031	18.0	8.5	14.5	15.0	0.8
.68	160684*250M–F	1.043	0.276	0.650	0.886	0.031	26.5	7.0	16.5	22.5	0.8
.82	160824*250M–F	1.043	0.335	0.669	0.886	0.031	26.5	8.5	17.0	22.5	0.8

* Indicates capacitance tolerance: J = ±5%, K = ±10%, M = ±20%

Type 160 Metallized Polyester Radial Lead Capacitors

RoHS Compliant

Cap (µF)	Catalog Part Number	Inches					Millimeters				
		L	T	H	S	Ød	L	T	H	S	Ød
250 Vdc											
1.0	160105*250N–F	1.043	0.335	0.669	0.886	0.031	26.5	8.5	17.0	22.5	0.8
1.5	160155*250O–F	1.043	0.394	0.748	0.886	0.031	26.5	10.0	19.0	22.5	0.8
2.2	160225*250P–F	1.260	0.433	0.787	1.083	0.031	32.0	11.0	20.0	27.5	0.8
3.3	160335*250Q–F	1.260	0.512	0.886	1.083	0.031	32.0	13.0	22.5	27.5	0.8
4.7	160475*250R–F	1.260	0.591	1.181	1.083	0.031	32.0	15.0	30.0	27.5	0.8
6.8	160685*250S–F	1.457	0.709	1.299	1.083	0.031	37.0	18.0	33.0	27.5	0.8
400 Vdc											
.012	160123*400C–F	0.512	0.157	0.374	0.394	0.031	13.0	4.0	9.5	10.0	0.8
.015	160153*400C–F	0.512	0.157	0.374	0.394	0.031	13.0	4.0	9.5	10.0	0.8
.018	160183*400C–F	0.512	0.157	0.374	0.394	0.031	13.0	4.0	9.5	10.0	0.8
.022	160223*400C–F	0.512	0.157	0.374	0.394	0.031	13.0	4.0	9.5	10.0	0.8
.027	160273*400C–F	0.512	0.157	0.374	0.394	0.031	13.0	4.0	9.5	10.0	0.8
.033	160333*400D–F	0.512	0.197	0.433	0.394	0.031	13.0	5.0	11.0	10.0	0.8
.039	160393*400D–F	0.512	0.197	0.433	0.394	0.031	13.0	5.0	11.0	10.0	0.8
.047	160473*400E–F	0.512	0.236	0.472	0.394	0.031	13.0	6.0	12.0	10.0	0.8
.047	160473*400F–F	0.709	0.197	0.433	0.591	0.031	18.0	5.0	11.0	15.0	0.8
.056	160563*400F–F	0.709	0.197	0.433	0.591	0.031	18.0	5.0	11.0	15.0	0.8
.068	160683*400F–F	0.709	0.197	0.433	0.591	0.031	18.0	5.0	11.0	15.0	0.8
.082	160823*400F–F	0.709	0.197	0.433	0.591	0.031	18.0	5.0	11.0	15.0	0.8
.10	160104*400G–F	0.709	0.236	0.472	0.591	0.031	18.0	6.0	12.0	15.0	0.8
.12	160124*400G–F	0.709	0.236	0.472	0.591	0.031	18.0	6.0	12.0	15.0	0.8
.15	160154*400H–F	0.709	0.295	0.531	0.591	0.031	18.0	7.5	13.5	15.0	0.8
.15	160154*400L–F	1.043	0.236	0.591	0.886	0.031	26.5	6.0	15.0	22.5	0.8
.18	160184*400L–F	1.043	0.236	0.591	0.886	0.031	26.5	6.0	15.0	22.5	0.8
.22	160224*400L–F	1.043	0.236	0.591	0.886	0.031	26.5	6.0	15.0	22.5	0.8
.27	160274*400M–F	1.043	0.276	0.650	0.886	0.031	26.5	7.0	16.5	22.5	0.8
.33	160334*400M–F	1.043	0.276	0.650	0.886	0.031	26.5	7.0	16.5	22.5	0.8
.39	160394*400N–F	1.043	0.335	0.669	0.886	0.031	26.5	8.5	17.0	22.5	0.8
.47	160474*400N–F	1.043	0.335	0.669	0.886	0.031	26.5	8.5	17.0	22.5	0.8
.56	160564*400O–F	1.043	0.394	0.748	0.886	0.031	26.5	10.0	19.0	22.5	0.8
.68	160684*400P–F	1.260	0.433	0.787	1.083	0.031	32.0	11.0	20.0	27.5	0.8
.82	160824*400P–F	1.260	0.433	0.787	1.083	0.031	32.0	11.0	20.0	27.5	0.8
1.0	160105*400P–F	1.260	0.433	0.787	1.083	0.031	32.0	11.0	20.0	27.5	0.8
1.0	160105*400Q–F	1.260	0.512	0.886	1.083	0.031	32.0	13.0	22.5	27.5	0.8
630 Vdc											
.0039	160392*630C–F	0.512	0.157	0.374	0.394	0.031	13.0	4.0	9.5	10.0	0.8
.0047	160472*630C–F	0.512	0.157	0.374	0.394	0.031	13.0	4.0	9.5	10.0	0.8
.0056	160562*630C–F	0.512	0.157	0.374	0.394	0.031	13.0	4.0	9.5	10.0	0.8
.0068	160682*630C–F	0.512	0.157	0.374	0.394	0.031	13.0	4.0	9.5	10.0	0.8
.0082	160822*630C–F	0.512	0.157	0.374	0.394	0.031	13.0	4.0	9.5	10.0	0.8
.010	160103*630C–F	0.512	0.157	0.374	0.394	0.031	13.0	4.0	9.5	10.0	0.8
.012	160123*630D–F	0.512	0.197	0.433	0.394	0.031	13.0	5.0	11.0	10.0	0.8
.015	160153*630D–F	0.512	0.197	0.433	0.394	0.031	13.0	5.0	11.0	10.0	0.8
.018	160183*630D–F	0.512	0.197	0.433	0.394	0.031	13.0	5.0	11.0	10.0	0.8
.022	160223*630E–F	0.512	0.236	0.472	0.394	0.031	13.0	6.0	12.0	10.0	0.8
.027	160273*630F–F	0.709	0.197	0.433	0.591	0.031	18.0	5.0	11.0	15.0	0.8
.033	160333*630F–F	0.709	0.197	0.433	0.591	0.031	18.0	5.0	11.0	15.0	0.8
.039	160393*630G–F	0.709	0.236	0.472	0.591	0.031	18.0	6.0	12.0	15.0	0.8
.047	160473*630G–F	0.709	0.236	0.472	0.591	0.031	18.0	6.0	12.0	15.0	0.8
.056	160563*630G–F	0.709	0.236	0.472	0.591	0.031	18.0	6.0	12.0	15.0	0.8

* Indicates capacitance tolerance: J = ±5%, K = ±10%, M = ±20%

Type 160 Metallized Polyester Radial Lead Capacitors

RoHS Compliant

Cap (µF)	Catalog Part Number	Inches					Millimeters				
		L	T	H	S	Ød	L	T	H	S	Ød
630 Vdc											
.068	160683*630H–F	0.709	0.295	0.531	0.591	0.031	18.0	7.5	13.5	15.0	0.8
.068	160683*630L–F	1.043	0.236	0.591	0.886	0.031	26.5	6.0	15.0	22.5	0.8
.082	160823*630L–F	1.043	0.236	0.591	0.886	0.031	26.5	6.0	15.0	22.5	0.8
.10	160104*630L–F	1.043	0.236	0.591	0.886	0.031	26.5	6.0	15.0	22.5	0.8
.12	160124*630M–F	1.043	0.276	0.650	0.886	0.031	26.5	7.0	16.5	22.5	0.8
.15	160154*630M–F	1.043	0.276	0.650	0.886	0.031	26.5	7.0	16.5	22.5	0.8
.18	160184*630N–F	1.043	0.335	0.669	0.886	0.031	26.5	8.5	17.0	22.5	0.8
.22	160224*630N–F	1.043	0.335	0.669	0.886	0.031	26.5	8.5	17.0	22.5	0.8
.27	160274*630Q–F	1.260	0.512	0.886	1.083	0.031	32.0	13.0	22.5	27.5	0.8
.33	160334*630P–F	1.260	0.433	0.787	1.083	0.031	32.0	11.0	20.0	27.5	0.8
.39	160394*630P–F	1.260	0.433	0.787	1.083	0.031	32.0	11.0	20.0	27.5	0.8
.47	160474*630Q–F	1.260	0.512	0.886	1.083	0.031	32.0	13.0	22.5	27.5	0.8
1000 Vdc											
.0022	160222*1000C–F	0.512	0.157	0.374	0.394	0.031	13.0	4.0	9.5	10.0	0.8
.0027	160272*1000C–F	0.512	0.157	0.374	0.394	0.031	13.0	4.0	9.5	10.0	0.8
.0033	160332*1000C–F	0.512	0.157	0.374	0.394	0.031	13.0	4.0	9.5	10.0	0.8
.0039	160392*1000D–F	0.512	0.197	0.433	0.394	0.031	13.0	5.0	11.0	10.0	0.8
.0047	160472*1000D–F	0.512	0.197	0.433	0.394	0.031	13.0	5.0	11.0	10.0	0.8
.0056	160562*1000D–F	0.512	0.197	0.433	0.394	0.031	13.0	5.0	11.0	10.0	0.8
.0068	160682*1000D–F	0.512	0.197	0.433	0.394	0.031	13.0	5.0	11.0	10.0	0.8
.0082	160822*1000D–F	0.512	0.197	0.433	0.394	0.031	13.0	5.0	11.0	10.0	0.8
.010	160103*1000F–F	0.709	0.197	0.433	0.591	0.031	18.0	5.0	11.0	15.0	0.8
.012	160123*1000F–F	0.709	0.197	0.433	0.591	0.031	18.0	5.0	11.0	15.0	0.8
.015	160153*1000F–F	0.709	0.236	0.472	0.591	0.031	18.0	6.0	12.0	15.0	0.8
.018	160183*1000G–F	0.709	0.236	0.472	0.591	0.031	18.0	6.0	12.0	15.0	0.8
.022	160223*1000G–F	0.709	0.236	0.472	0.591	0.031	18.0	6.0	12.0	15.0	0.8
.027	160273*1000H–F	0.709	0.295	0.531	0.591	0.031	18.0	7.5	13.5	15.0	0.8
.033	160333*1000L–F	1.043	0.236	0.591	0.886	0.031	26.5	6.0	15.0	22.5	0.8
.039	160393*1000L–F	1.043	0.236	0.591	0.886	0.031	26.5	6.0	15.0	22.5	0.8
.047	160473*1000L–F	1.043	0.236	0.591	0.886	0.031	26.5	6.0	15.0	22.5	0.8
.056	160563*1000M–F	1.043	0.276	0.650	0.886	0.031	26.5	7.0	16.5	22.5	0.8
.068	160683*1000M–F	1.043	0.276	0.650	0.886	0.031	26.5	7.0	16.5	22.5	0.8
.082	160823*1000N–F	1.043	0.335	0.669	0.886	0.031	26.5	8.5	17.0	22.5	0.8
.10	160104*1000N–F	1.043	0.335	0.669	0.886	0.031	26.5	8.5	17.0	22.5	0.8
.12	160124*1000O–F	1.043	0.394	0.748	0.886	0.031	26.5	10.0	19.0	22.5	0.8
.15	160154*1000P–F	1.260	0.433	0.787	1.083	0.031	32.0	11.0	20.0	27.5	0.8
.18	160184*1000Q–F	1.260	0.512	0.886	1.083	0.031	32.0	13.0	22.5	27.5	0.8
.22	160224*1000Q–F	1.260	0.512	0.886	1.083	0.031	32.0	13.0	22.5	27.5	0.8

* Indicates capacitance tolerance: J = ±5%, K = ±10%, M = ±20%

Part Numbering System

160	104	K	100	C	–F
Series	Capacitance	Tolerance	Voltage	Case Code	ROHS Compliant
160	392 = .0039 µF	J = ±5%	100 = 100 Vdc	C	
	103 = .01 µF	K = ±10%	250 = 250 Vdc	D	
	104 = .1 µF	M = ±20%	630 = 630 Vdc	E	
	105 = 1.0 µF		1000 = 1000 Vdc	F	
				etc.	

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