

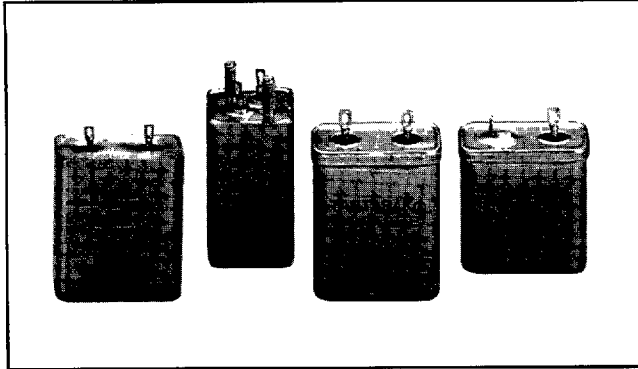
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A COMPANY OF
VISHAY

SPRAGUE

TYPE 200D, 202D Wet Tantalum Capacitors

Wet Sintered Anode TANTALEX[®] Components
TANTAPAK[®] Capacitor Assemblies



FEATURES

TANTAPAK[®] Wet Sintered Anode capacitor assemblies are widely used in filter, coupling, bypass and time-delay circuits in computers, missiles, airborne equipment, radar and fire control systems.

TANTAPAK[®] capacitor assemblies are available in 3 standard case styles and 13 case codes. Type 200D units are constructed with the negative terminal connected to the case; they are available only in the "A" case, in five case codes.

Type 202D capacitors are designed to meet the performance and marking requirements of Military Style CL55 in accordance with MIL-C-3965.

PERFORMANCE CHARACTERISTICS

Operating Temperature: - 55°C to + 125°C.

Capacitance Tolerance: At 120Hz, + 25°C. ± 20% standard. ± 10% available.

DC Leakage Current (DCL Max.):

At + 25°C: Leakage current shall not exceed the values listed in the Standard Ratings Tables.

Life Test: Capacitors shall withstand 2000 hours at a temperature of + 85°C or + 125°C at the rated DC working voltage.

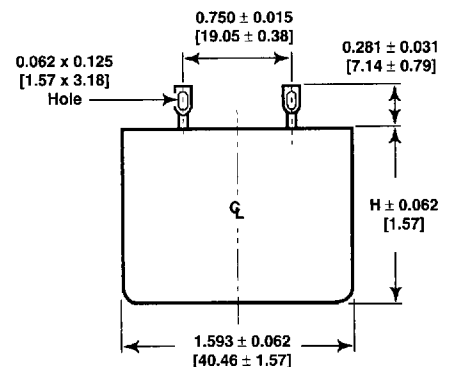
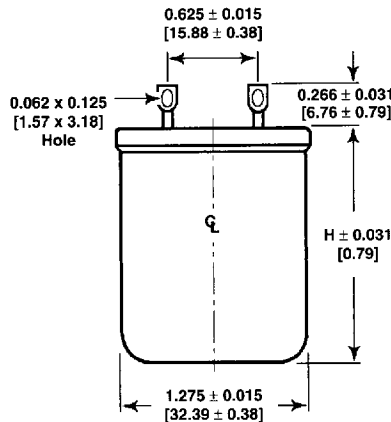
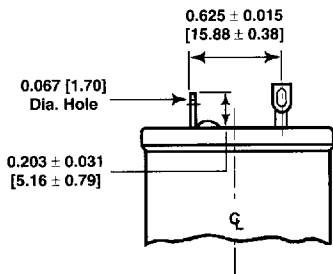
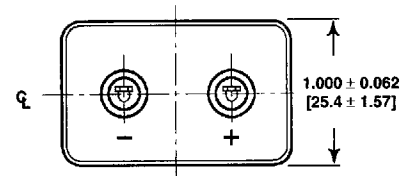
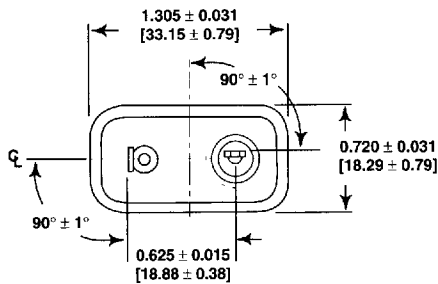
Following the life test:

1. DCL shall not exceed the original requirement.
2. ESR shall not be more than 130% of the initial requirement.
3. Capacitance shall not change more than ± 25%.

DIMENSIONAL CONFIGURATIONS - CASE STYLES (Numbers in brackets indicate millimeters)

Series "A" Case

Series "B" Case



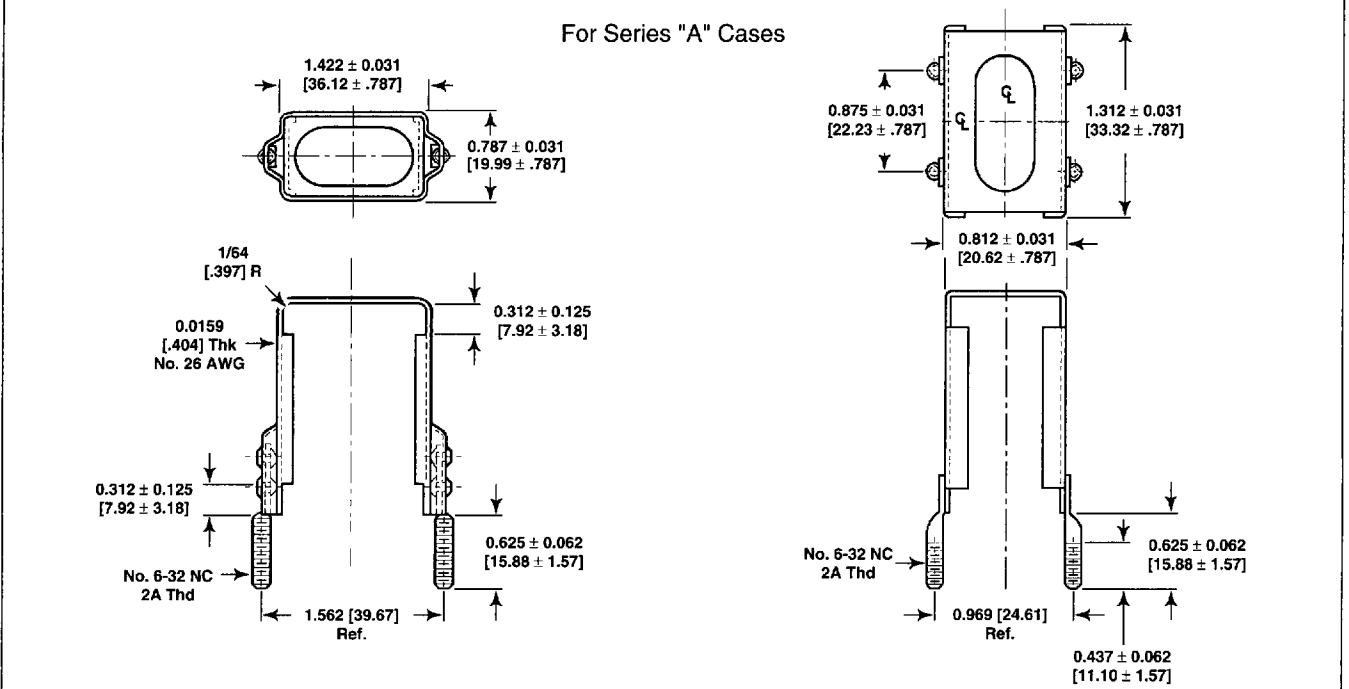
TYPE 200D

TYPE 202D

TYPE 200D, 202D

DIMENSIONAL CONFIGURATIONS - CASE STYLES [Numbers in brackets indicate millimeters]			
	CASE CODE	H CASE HEIGHT	TYPICAL WEIGHT (Grams)
	A1	1.062 [26.97]	45
	A2	1.375 [34.93]	60
	A3	1.625 [41.28]	80
	A4	2.000 [50.80]	100
	A5	2.500 [63.50]	125
	B1	1.500 [38.10]	170
	B2	1.875 [47.63]	210
	B3	2.250 [57.15]	250
	B4	2.625 [66.68]	290
	B5	3.000 [76.20]	335
	B6	3.375 [85.73]	380
	B7	3.750 [95.25]	420
D3	1.625 [41.28]	120	

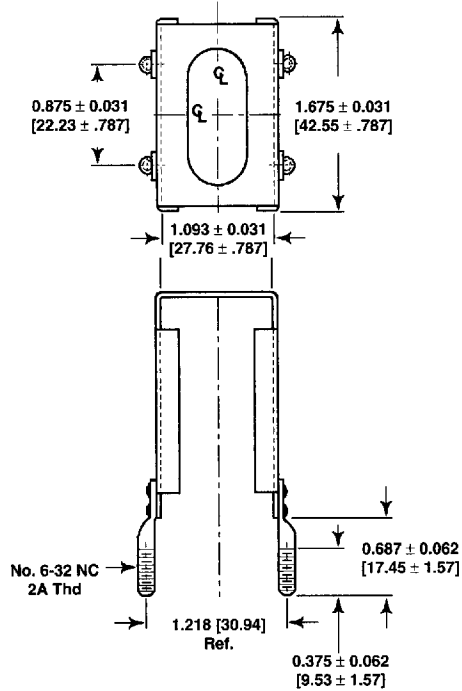
DIMENSIONAL CONFIGURATIONS - MOUNTING BRACKETS [Numbers in brackets indicate millimeters]



CASE CODE	CASE HEIGHT	BRACKET PART NUMBER	CASE CODE	CASE HEIGHT	BRACKET PART NUMBER	MILITARY STYLE BRACKET PART NUMBER
A1	1.062 [27.0]	50-1021F	A1	1.062 [27.0]	1-50-331L	CL050SA13
A2	1.375 [34.9]	50-1021G	A2	1.375 [34.9]	1-50-331M	CL050SD13
A3	1.625 [41.3]	50-1021H	A3	1.625 [41.3]	1-50-331N	CL050SA33
A4	2.000 [50.8]	50-1021J	A4	2.000 [50.8]	1-50-331P	CL050SD23
A5	2.500 [63.5]	50-1021K	A5	2.500 [63.5]	1-50-331R	CL050SD33

TYPE 200D, 202D

DIMENSIONAL CONFIGURATIONS - MOUNTING BRACKETS [Numbers in brackets indicate millimeters]



CASE CODE	CASE HEIGHT	BRACKET PART NUMBER
B1	1.500 [38.1]	1-50-331A
B2	1.875 [47.6]	1-50-331D
B3	2.250 [57.2]	1-50-331E
B4	2.625 [66.7]	1-50-331B
B5	3.000 [76.2]	1-50-331F
B6	3.375 [85.7]	1-50-331G
B7	3.750 [95.3]	1-50-331C

STANDARD RATINGS

CAPACITANCE (μ F)	CASE CODE	PART NUMBER* TYPE 200D	PART NUMBER* TYPE 202D	Max. ESR @ + 25°C (Ohms)	Max. IMP. @ - 55°C (Ohms)	Max. RMS RIPPLE 120Hz (Amps)
15 WVDC @ + 85°C ... 10 WVDC @ + 125°C						
950.0	A1	200D967X0015A1	202D967X0015A1	0.25	3.1	1.17
1200.0	A2	200D128X0015A2	202D128X0015A2	0.21	2.3	1.45
1400.0	A3	200D148X0015A3	202D148X0015A3	0.18	1.7	1.67
1600.0	A1	200D168X0015A1	202D168X0015A1	0.25	4.2	1.20
2100.0	A2	200D218X0015A2	202D218X0015A2	0.19	3.1	1.52
2100.0	A4	200D218X0015A4	202D218X0015A4	0.12	1.3	2.22
2200.0	D3	—	202D228X0015D3	0.30	5.8	1.14
2400.0	A5	200D248X0015A5	202D248X0015A5	0.10	1.15	2.66
2700.0	A3	200D278X0015A3	202D278X0015A3	0.15	2.5	1.83
3200.0	A4	200D328X0015A4	202D328X0015A4	0.13	2.1	2.13
3300.0	B1	—	202D338X0015B1	0.14	3.2	2.17
4300.0	A5	200D438X0015A5	202D438X0015A5	0.095	1.6	2.73
4500.0	B2	—	202D458X0015B2	0.11	2.4	2.65
5600.0	B3	—	202D568X0015B3	0.085	1.9	3.24
6700.0	B4	—	202D678X0015B4	0.070	1.6	3.80
7800.0	B5	—	202D788X0015B5	0.061	1.4	4.28
9000.0	B6	—	202D908X0015B6	0.053	1.2	4.84
10000.0	B7	—	202D109X0015B7	0.047	1.1	5.38
20 WVDC @ + 85°C ... 13 WVDC @ + 125°C						
1300.0	A1	200D138X0020A1	202D138X0020A1	0.25	5.0	1.20
1700.0	A2	200D178X0020A2	202D178X0020A2	0.19	3.8	1.52
1900.0	D3	—	202D198X0020D3	0.21	5.0	1.36
2200.0	A3	200D228X0020A3	202D228X0020A3	0.15	3.0	1.83
2700.0	A4	200D278X0020A4	202D278X0020A4	0.13	2.5	2.13
2800.0	B1	—	202D288X0020B1	0.14	3.3	2.17
3500.0	A5	200D358X0020A5	202D358X0020A5	0.094	1.9	2.75
3800.0	B2	—	202D388X0020B2	0.11	2.5	2.65
4700.0	B3	—	202D478X0020B3	0.085	2.0	3.24
5600.0	B4	—	202D568X0020B4	0.071	1.7	3.77
6600.0	B5	—	202D668X0020B5	0.061	1.4	4.28
7500.0	B6	—	202D758X0020B6	0.053	1.3	4.84
8500.0	B7	—	202D858X0020B7	0.047	1.1	5.38

* The Part Numbers listed are for $\pm 20\%$ tolerance. To specify $\pm 10\%$ tolerance, change the digit following "X" from "0" to "9".

TYPE 200D, 202D

STANDARD RATINGS						
CAPACITANCE (μ F)	CASE CODE	PART NUMBER* TYPE 200D	PART NUMBER* TYPE 202D	Max. ESR @ + 25°C (Ohms)	Max. IMP. @ - 55°C (Ohms)	Max. RMS RIPPLE 120Hz (Amps)
25 WVDC @ + 85°C . . . 15 WVDC @ + 125°C						
1100.0	A1	200D118X0025A1	202D118X0025A1	0.30	5.3	1.10
1400.0	A2	200D148X0025A2	202D148X0025A2	0.23	4.0	1.38
1600.0	D3	—	202D168X0025D3	0.21	5.3	1.36
1800.0	A3	200D188X0025A3	202D188X0025A3	0.18	3.2	1.67
2200.0	A4	200D228X0025A4	202D228X0025A4	0.15	2.7	1.98
2300.0	B1	—	202D238X0025B1	0.14	3.5	2.17
2900.0	A5	200D298X0025A5	202D298X0025A5	0.11	2.0	2.54
3100.0	B2	—	202D318X0025B2	0.11	2.6	2.65
3900.0	B3	—	202D398X0025B3	0.085	2.1	3.24
4700.0	B4	—	202D478X0025B4	0.071	1.8	3.77
5500.0	B5	—	202D558X0025B5	0.061	1.5	4.28
6200.0	B6	—	202D628X0025B6	0.053	1.3	4.84
7000.0	B7	—	202D708X0025B7	0.047	1.2	5.38
30 WVDC @ + 85°C . . . 20 WVDC @ + 125°C						
520.0	A1	200D527X0030A1	202D527X0030A1	0.48	5.3	0.87
660.0	A2	200D667X0030A2	202D667X0030A2	0.38	4.2	1.08
820.0	A3	200D827X0030A3	202D827X0030A3	0.31	2.9	1.27
900.0	A1	200D907X0030A1	202D907X0030A1	0.37	5.8	0.99
1200.0	A2	200D128X0030A2	202D128X0030A2	0.27	4.4	1.28
1200.0	A4	200D128X0030A4	202D128X0030A4	0.21	2.3	1.68
1300.0	A5	200D138X0030A5	202D138X0030A5	0.19	2.1	1.93
1300.0	D3	—	202D138X0030D3	0.26	5.5	1.22
1500.0	A3	200D158X0030A3	202D158X0030A3	0.22	3.5	1.50
1800.0	A4	200D188X0030A4	202D188X0030A4	0.18	2.9	1.81
2000.0	B1	—	202D208X0030B1	0.17	1.7	1.97
2400.0	A5	200D248X0030A5	202D248X0030A5	0.14	2.2	2.25
2600.0	B2	—	202D268X0030B2	0.13	2.8	2.43
3300.0	B3	—	202D338X0030B3	0.10	2.2	2.98
4000.0	B4	—	202D408X0030B4	0.085	1.8	3.45
4600.0	B5	—	202D468X0030B5	0.073	1.6	3.92
5300.0	B6	—	202D538X0030B6	0.064	1.4	4.40
6000.0	B7	—	202D608X0030B7	0.057	1.2	4.88
35 WVDC @ + 85°C . . . 22 WVDC @ + 125°C						
720.0	A1	200D727X0035A1	202D727X0035A1	0.37	6.3	0.99
960.0	A2	200D967X0035A2	202D967X0035A2	0.27	4.7	1.28
1100.0	D3	—	202D118X0035D3	0.30	5.7	1.14
1200.0	A3	200D128X0035A3	202D128X0035A3	0.22	3.8	1.51
1400.0	A4	200D148X0035A4	202D148X0035A4	0.18	3.2	1.81
1600.0	B1	—	202D168X0035B1	0.20	3.8	1.82
1900.0	A5	200D198X0035A5	202D198X0035A5	0.14	2.4	2.25
2200.0	B2	—	202D228X0035B2	0.15	2.9	2.27
2700.0	B3	—	202D278X0035B3	0.12	2.3	2.72
3200.0	B4	—	202D328X0035B4	0.10	1.9	3.18
3800.0	B5	—	202D388X0035B5	0.085	1.6	3.63
4300.0	B6	—	202D438X0035B6	0.075	1.4	4.07
4900.0	B7	—	202D498X0035B7	0.067	1.3	4.51
40 WVDC @ + 85°C . . . 25 WVDC @ + 125°C						
600.0	A1	200D607X0040A1	202D607X0040A1	0.33	6.7	1.04
800.0	A2	200D807X0040A2	202D807X0040A2	0.25	5.0	1.33
880.0	D3	—	202D887X0040D3	0.30	6.0	1.14
1000.0	A3	200D108X0040A3	202D108X0040A3	0.20	4.0	1.58
1200.0	A4	200D128X0040A4	202D128X0040A4	0.17	3.3	1.86
1300.0	B1	—	202D138X0040B1	0.20	4.0	1.82
1600.0	A5	200D168X0040A5	202D168X0040A5	0.13	2.5	2.34
1800.0	B2	—	202D188X0040B2	0.15	3.0	2.27
2200.0	B3	—	202D228X0040B3	0.12	2.4	2.72
2600.0	B4	—	202D268X0040B4	0.10	2.0	3.18
3100.0	B5	—	202D318X0040B5	0.086	1.7	3.61
3500.0	B6	—	202D358X0040B6	0.075	1.5	4.07
4000.0	B7	—	202D408X0040B7	0.057	1.3	4.51

* The Part Numbers listed are for \pm 20% tolerance. To specify \pm 10% tolerance, change the digit following "X" from "0" to "9".

TYPE 200D, 202D

STANDARD RATINGS						
CAPACITANCE (μ F)	CASE CODE	PART NUMBER* TYPE 200D	PART NUMBER* TYPE 202D	Max. ESR @ + 25°C (Ohms)	Max. IMP. @ - 55°C (Ohms)	Max. RMS RIPPLE 120Hz (Amps)
50 WVDC @ + 85°C . . . 35 WVDC @ + 125°C						
400 0	A1	200D407X0050A1	202D407X0050A1	0.50	7.2	0.85
430.0	A1	200D437X0050A1	202D437X0050A1	0.58	6.4	0.79
490.0	A1	200D497X0050A1	202D497X0050A1	0.33	7.2	1.04
500.0	A2	200D507X0050A2	202D507X0050A2	0.40	5.6	1.05
600 0	A3	200D607X0050A3	202D607X0050A3	0.33	4.1	1.23
660 0	A2	200D667X0050A2	202D667X0050A2	0.25	5.4	1.33
720.0	D3	—	202D727X0050D3	0.30	6.2	1.14
800.0	A4	200D807X0050A4	202D807X0050A4	0.25	3.1	1.54
820.0	A3	200D827X0050A3	202D827X0050A3	0.20	4.3	1.58
980.0	A4	200D987X0050A4	202D987X0050A4	0.17	3.6	1.86
1000.0	A5	200D108X0050A5	202D108X0050A5	0.25	2.8	2.84
1100.0	B1	—	202D118X0050B1	0.20	4.2	1.82
1300.0	A5	200D138X0050A5	202D138X0050A5	0.13	2.7	2.34
1400.0	B2	—	202D148X0050B2	0.15	3.1	2.27
1800.0	B3	—	202D188X0050B3	0.12	2.5	2.72
2200.0	B4	—	202D228X0050B4	0.10	2.0	3.18
2500.0	B5	—	202D258X0050B5	0.086	1.8	3.61
2900.0	B6	—	202D298X0050B6	0.075	1.6	4.07
3200 0	B7	—	202D328X0050B7	0.067	1.4	4.51
60 WVDC @ + 85°C . . . 40 WVDC @ + 125°C						
410.0	A1	200D417X0060A1	202D417X0060A1	0.33	7.5	1.04
550 0	A2	200D557X0060A2	202D557X0060A2	0.25	5.6	1.33
600.0	D3	—	202D607X0060D3	0.33	6.5	1.09
680.0	A3	200D687X0060A3	202D687X0060A3	0.20	4.5	1.58
820.0	A4	200D827X0060A4	202D827X0060A4	0.17	3.7	1.86
900.0	B1	—	202D907X0060B1	0.22	4.3	1.73
1100 0	A5	200D118X0060A5	202D118X0060A5	0.13	2.8	2.34
1200.0	B2	—	202D128X0060B2	0.16	3.3	2.19
1500.0	B3	—	202D158X0060B3	0.13	2.6	2.62
1800.0	B4	—	202D188X0060B4	0.11	2.2	3.03
2100.0	B5	—	202D218X0060B5	0.093	1.9	3.47
2400.0	B6	—	202D248X0060B6	0.081	1.6	3.9
2700.0	B7	—	202D278X0060B7	0.072	1.4	4.35
75 WVDC @ + 85°C . . . 50 WVDC @ + 125°C						
270 0	A1	200D277X0075A1	202D277X0075A1	0.56	8.5	0.80
330 0	A2	200D337X0075A2	202D337X0075A2	0.46	7.0	0.98
400 0	A1	200D407X0075A1	202D407X0075A1	0.26	7.5	1.18
400 0	A3	200D407X0075A3	202D407X0075A3	0.38	5.0	1.15
530 0	A2	200D537X0075A2	202D537X0075A2	0.20	5.6	1.48
480.0	D3	—	202D487X0075D3	0.42	6.8	0.96
660 0	A3	200D667X0075A3	202D667X0075A3	0.16	4.5	1.77
600.0	A4	200D607X0075A4	202D607X0075A4	0.25	3.65	1.54
660 0	A5	200D667X0075A5	202D667X0075A5	0.23	3.5	1.76
790.0	A4	200D797X0075A4	202D797X0075A4	0.13	3.7	2.13
720 0	B1	—	202D727X0075B1	0.28	4.5	1.54
1100 0	A5	200D118X0075A5	202D118X0075A5	0.096	2.8	2.72
960 0	B2	—	202D967X0075B2	0.21	3.4	1.91
1200 0	B3	—	202D128X0075B3	0.17	2.7	2.29
1400 0	B4	—	202D148X0075B4	0.14	2.1	2.69
1700.0	B5	—	202D178X0075B5	0.12	1.9	3.06
1900.0	B6	—	202D198X0075B6	0.11	1.7	3.36
2200.0	B7	—	202D228X0075B7	0.095	1.5	3.78
85 WVDC @ + 85°C . . . 60 WVDC @ + 125°C						
280 0	A1	200D287X0085A1	202D287X0085A1	0.33	9.2	1.04
370.0	A2	200D377X0085A2	202D377X0085A2	0.25	6.9	1.33
400.0	D3	—	202D407X0085D3	0.42	7.0	0.96
470 0	A3	200D477X0085A3	202D477X0085A3	0.20	5.5	1.58
570 0	A4	200D577X0085A4	202D577X0085A4	0.17	4.6	1.86
600.0	B1	—	202D607X0085B1	0.28	4.7	1.54
750.0	A5	200D757X0085A5	202D757X0085A5	0.13	3.4	2.34

* The Part Numbers listed are for \pm 20% tolerance. To specify \pm 10% tolerance, change the digit following "X" from "0" to "9".

TYPE 200D, 202D

STANDARD RATINGS						
CAPACITANCE (μ F)	CASE CODE	PART NUMBER* TYPE 200D	PART NUMBER* TYPE 202D	Max. ESR @ + 25°C (Ohms)	Max. IMP. @ - 55°C (Ohms)	Max. RMS RIPPLE 120Hz (Amps)
85 WVDC @ + 85°C . . . 60 WVDC @ + 125°C						
800.0	B2	—	202D807X0085B2	0.21	3.5	1.91
1000.0	B3	—	202D108X0085B3	0.17	2.8	2.29
1200.0	B4	—	202D128X0085B4	0.14	2.4	2.69
1400.0	B5	—	202D148X0085B5	0.12	2.0	3.06
1600.0	B6	—	202D168X0085B6	0.11	1.8	3.36
1800.0	B7	—	202D188X0085B7	0.095	1.6	3.78
100 WVDC @ + 85°C . . . 70 WVDC @ + 125°C						
170.0	A1	200D177X0100A1	202D177X0100A1	0.94	15.0	0.62
220.0	A2	200D227X0100A2	202D227X0100A2	0.72	11.6	0.78
260.0	A1	200D267X0100A1	202D267X0100A1	0.40	8.3	0.95
260.0	A3	200D267X0100A3	202D267X0100A3	0.61	8.0	0.91
340.0	D3	—	202D347X0100D3	0.75	7.5	0.72
350.0	A2	200D357X0100A2	202D357X0100A2	0.30	6.2	1.21
350.0	A4	200D357X0100A4	202D357X0100A4	0.45	6.5	1.15
440.0	A3	200D447X0100A3	202D447X0100A3	0.24	5.0	1.44
440.0	A5	200D447X0100A5	202D447X0100A5	0.36	5.8	1.40
510.0	B1	—	202D517X0100B1	0.28	4.8	1.54
530.0	A4	200D537X0100A4	202D537X0100A4	0.20	4.2	1.72
680.0	B2	—	202D687X0100B2	0.21	3.6	1.91
700.0	A5	200D707X0100A5	202D707X0100A5	0.15	3.1	2.18
850.0	B3	—	202D857X0100B3	0.17	2.9	2.29
1000.0	B4	—	202D108X0100B4	0.14	2.4	2.69
1200.0	B5	—	202D128X0100B5	0.12	2.1	3.06
1400.0	B6	—	202D148X0100B6	0.11	1.8	3.36
1500.0	B7	—	202D158X0100B7	0.095	1.6	3.78
110 WVDC @ + 85°C . . . 75 WVDC @ + 125°C						
200.0	A1	200D207X0110A1	202D207X0110A1	0.40	12.0	0.95
260.0	A2	200D267X0110A2	202D267X0110A2	0.30	8.8	1.21
270.0	D3	—	202D277X0110D3	0.60	7.5	0.81
330.0	A3	200D337X0110A3	202D337X0110A3	0.24	7.0	1.44
410.0	B1	—	202D417X0110B1	0.28	5.0	1.54
430.0	A4	200D437X0110A4	202D437X0110A4	0.20	5.8	1.72
540.0	B2	—	202D547X0110B2	0.21	3.8	1.91
580.0	A5	200D587X0110A5	202D587X0110A5	0.15	4.4	2.18
680.0	B3	—	202D687X0110B3	0.17	3.0	2.29
820.0	B4	—	202D827X0110B4	0.14	2.5	2.69
950.0	B5	—	202D957X0110B5	0.12	2.1	3.06
1100.0	B6	—	202D118X0110B6	0.11	1.9	3.38
1200.0	B7	—	202D128X0110B7	0.095	1.7	3.78
125 WVDC @ + 85°C . . . 80 WVDC @ + 125°C						
170.0	A1	200D177X0125A1	202D177X0125A1	0.40	15.0	0.95
220.0	A2	200D227X0125A2	202D227X0125A2	0.30	12.0	1.21
220.0	D3	—	202D227X0125D3	0.42	8.0	0.96
280.0	A3	200D287X0125A3	202D287X0125A3	0.24	9.0	1.44
340.0	A4	200D347X0125A4	202D347X0125A4	0.20	7.5	1.72
340.0	B1	—	202D347X0125B1	0.28	5.4	1.54
450.0	A5	200D457X0125A5	202D457X0125A5	0.15	5.7	2.18
450.0	B2	—	202D457X0125B2	0.21	4.0	1.91
560.0	B3	—	202D567X0125B3	0.17	3.2	2.29
670.0	B4	—	202D677X0125B4	0.14	2.7	2.69
790.0	B5	—	202D797X0125B5	0.12	2.4	3.06
900.0	B6	—	202D907X0125B6	0.11	2.0	3.38
1000.0	B7	—	202D108X0125B7	0.095	1.8	3.78
150 WVDC @ + 85°C . . . 100 WVDC @ + 125°C						
70.0	A1	200D706X0150A1	202D706X0150A1	2.27	28.8	0.40
90.0	A2	200D906X0150A2	202D906X0150A2	1.77	22.4	0.50
100.0	A3	200D107X0150A3	202D107X0150A3	1.59	16.4	0.56
140.0	A4	200D147X0150A4	202D147X0150A4	1.14	12.4	0.72
180.0	A5	200D187X0150A5	202D187X0150A5	0.88	11.2	0.90

* The Part Numbers listed are for $\pm 20\%$ tolerance. To specify $\pm 10\%$ tolerance, change the digit following "X" from "0" to "9".

TYPE 200D, 202D

EXTENDED RATINGS						
CAPACITANCE (μ F)	CASE CODE	PART NUMBER* TYPE 200D	PART NUMBER* TYPE 202D	Max. ESR @ + 25°C (Ohms)	Max. IMP. @ - 55°C (Ohms)	Max. RMS RIPPLE 120Hz (Amps)
6 WVDC @ + 85°C . . . 4 WVDC @ + 125°C						
6600.0	A1	200D668X0006A1	202D668X0006A1	0.28	2.3	1.13
8200.0	A2	200D828X0006A2	202D828X0006A2	0.22	1.8	1.41
8800.0	D3	—	202D888X0006D3	0.25	3.8	1.25
9900.0	A3	200D998X0006A3	202D998X0006A3	0.18	1.5	1.67
13000.0	A4	200D139X0006A4	202D139X0006A4	0.14	1.1	2.05
15000.0	B1	—	202D159X0006B1	0.12	1.8	2.35
16000.0	A5	200D169X0006A5	202D169X0006A5	0.11	0.90	2.54
21000.0	B2	—	202D219X0006B2	0.086	1.29	2.99
27000.0	B3	—	202D279X0006B3	0.067	1.0	3.64
33000.0	B4	—	202D339X0006B4	0.055	0.82	4.29
39000.0	B5	—	202D399X0006B5	0.046	0.69	4.93
45000.0	B6	—	202D459X0006B6	0.04	0.60	5.57
51000.0	B7	—	202D519X0006B7	0.035	0.53	6.23
8 WVDC @ + 85°C . . . 5 WVDC @ + 125°C						
5400.0	A1	200D548X0008A1	202D548X0008A1	0.28	2.8	1.13
6800.0	A2	200D688X0008A2	202D688X0008A2	0.22	2.2	1.41
7200.0	D3	—	202D728X0008D3	0.25	4.0	1.25
8200.0	A3	200D828X0008A3	202D828X0008A3	0.18	1.8	1.67
11000.0	A4	200D119X0008A4	202D119X0008A4	0.14	1.4	2.05
14000.0	A5	200D149X0008A5	202D149X0008A5	0.11	1.1	2.35
14000.0	B1	—	202D149X0008B1	0.12	1.8	2.54
20000.0	B2	—	202D209X0008B2	0.086	1.3	2.99
25000.0	B3	—	202D259X0008B3	0.067	1.0	3.64
31000.0	B4	—	202D319X0008B4	0.055	0.82	4.29
36000.0	B5	—	202D369X0008B5	0.046	0.69	4.93
42000.0	B6	—	202D429X0008B6	0.04	0.60	5.57
48000.0	B7	—	202D489X0008B7	0.035	0.53	6.27
10 WVDC @ + 85°C . . . 7 WVDC @ + 125°C						
4500.0	A1	200D458X0010A1	202D458X0010A1	0.28	3.4	1.13
5600.0	A2	200D568X0010A2	202D568X0010A2	0.22	2.7	1.41
6000.0	D3	—	202D608X0010D3	0.25	4.2	1.25
6800.0	A3	200D688X0010A3	202D688X0010A3	0.18	2.2	1.67
9000.0	A4	200D908X0010A4	202D908X0010A4	0.14	1.7	2.05
11000.0	A5	200D119X0010A5	202D119X0010A5	0.11	1.4	2.35
12000.0	B1	—	202D129X0010B1	0.12	1.8	2.54
17000.0	B2	—	202D179X0010B2	0.086	1.3	2.99
22000.0	B3	—	202D229X0010B3	0.067	1.0	3.64
26000.0	B4	—	202D269X0010B4	0.055	0.82	4.29
31000.0	B5	—	202D319X0010B5	0.046	0.69	4.93
36000.0	B6	—	202D369X0010B6	0.04	0.60	5.57
41000.0	B7	—	202D419X0010B7	0.035	0.53	6.27
15 WVDC @ + 85°C . . . 10 WVDC @ + 125°C						
3100.0	A1	200D318X0015A1	202D318X0015A1	0.28	3.9	1.13
3900.0	A2	200D398X0015A2	202D398X0015A2	0.22	3.1	1.41
4000.0	D3	—	202D408X0015D3	0.30	4.8	1.14
4700.0	A3	200D478X0015A3	202D478X0015A3	0.18	2.6	1.67
6200.0	A4	200D628X0015A4	202D628X0015A4	0.14	1.9	2.05
7800.0	A5	200D788X0015A5	202D788X0015A5	0.11	1.6	2.54
8200.0	B1	—	202D828X0015B1	0.16	2.2	2.03
11000.0	B2	—	202D119X0015B2	0.11	1.6	2.64
15000.0	B3	—	202D159X0015B3	0.089	1.2	3.16
18000.0	B4	—	202D189X0015B4	0.073	1.0	3.72
21000.0	B5	—	202D219X0015B5	0.062	0.85	4.25
25000.0	B6	—	202D259X0015B6	0.053	0.73	4.84
28000.0	B7	—	202D289X0015B7	0.047	0.65	5.38

* The Part Numbers listed are for \pm 20% tolerance. To specify \pm 10% tolerance, change the digit following "X" from "0" to "9".

TYPE 200D, 202D

EXTENDED RATINGS						
CAPACITANCE (μ F)	CASE CODE	PART NUMBER* TYPE 200D	PART NUMBER* TYPE 202D	Max. ESR @ + 25°C (Ohms)	Max. IMP. @ - 55°C (Ohms)	Max. RMS RIPPLE 120Hz (Amps)
20 WVDC @ + 85°C . . . 13 WVDC @ + 125°C						
2600.0	A1	200D268X0020A1	202D268X0020A1	0.28	3.9	1.13
3300.0	A2	200D338X0020A2	202D338X0020A2	0.22	3.1	1.41
3300.0	D3	—	202D338X0020D3	0.30	4.8	1.14
4000.0	A3	200D408X0020A3	202D408X0020A3	0.18	2.6	1.67
5300.0	A4	200D538X0020A4	202D538X0020A4	0.14	1.9	2.05
6600.0	A5	200D668X0020A5	202D668X0020A5	0.11	1.6	2.54
6800.0	B1	—	202D688X0020B1	0.16	2.2	2.03
9500.0	B2	—	202D958X0020B2	0.11	1.6	2.54
12000.0	B3	—	202D129X0020B3	0.089	1.2	3.16
15000.0	B4	—	202D159X0020B4	0.072	1.0	3.72
18000.0	B5	—	202D189X0020B5	0.062	0.85	4.25
20000.0	B6	—	202D209X0020B6	0.053	0.73	4.84
23000.0	B7	—	202D239X0020B7	0.047	0.65	5.38
25 WVDC @ + 85°C . . . 15 WVDC @ + 125°C						
2200.0	A1	200D228X0025A1	202D228X0025A1	0.28	4.1	1.13
2700.0	A2	200D278X0025A2	202D278X0025A2	0.22	3.3	1.41
2700.0	D3	—	202D278X0025D3	0.30	4.8	1.14
3200.0	A3	200D328X0025A3	202D328X0025A3	0.18	2.8	1.67
4300.0	A4	200D438X0025A4	202D438X0025A4	0.14	2.1	2.05
5400.0	A5	200D548X0025A5	202D548X0025A5	0.11	1.7	2.54
5600.0	B1	—	202D568X0025B1	0.16	2.4	2.03
7800.0	B2	—	202D788X0025B2	0.11	1.7	2.64
10000.0	B3	—	202D109X0025B3	0.089	1.3	3.16
12000.0	B4	—	202D129X0025B4	0.072	1.1	3.72
15000.0	B5	—	202D159X0025B5	0.062	0.92	4.25
17000.0	B6	—	202D179X0025B6	0.053	0.80	4.84
19000.0	B7	—	202D199X0025B7	0.047	0.71	5.38
30 WVDC @ + 85°C . . . 20 WVDC @ + 125°C						
1800.0	A1	200D188X0030A1	202D188X0030A1	0.28	4.5	1.13
2200.0	A2	200D228X0030A2	202D228X0030A2	0.22	3.6	1.41
2200.0	D3	—	202D228X0030D3	0.33	5.0	1.09
2600.0	A3	200D268X0030A3	202D268X0030A3	0.18	3.0	1.67
3500.0	A4	200D358X0030A4	202D358X0030A4	0.14	2.3	2.05
4400.0	A5	200D448X0030A5	202D448X0030A5	0.11	1.8	2.54
4700.0	B1	—	202D478X0030B1	0.16	2.5	2.03
6600.0	B2	—	202D668X0030B2	0.11	1.8	2.64
8500.0	B3	—	202D858X0030B3	0.089	1.4	3.16
10000.0	B4	—	202D109X0030B4	0.073	1.14	3.72
12000.0	B5	—	202D129X0030B5	0.062	0.96	4.25
14000.0	B6	—	202D149X0030B6	0.053	0.83	4.84
16000.0	B7	—	202D169X0030B7	0.047	0.74	5.38
35 WVDC @ + 85°C . . . 22 WVDC @ + 125°C						
1400.0	A1	200D148X0035A1	202D148X0035A1	0.28	5.1	1.13
1800.0	A2	200D188X0035A2	202D188X0035A2	0.22	4.1	1.41
1900.0	D3	—	202D198X0035D3	0.35	5.2	1.06
2200.0	A3	200D228X0035A3	202D228X0035A3	0.18	3.4	1.67
2900.0	A4	200D298X0035A4	202D298X0035A4	0.14	2.6	2.05
3600.0	A5	200D368X0035A5	202D368X0035A5	0.11	2.1	2.54
3900.0	B1	—	202D398X0035B1	0.16	2.7	2.03
5500.0	B2	—	202D558X0035B2	0.11	1.9	2.64
7000.0	B3	—	202D708X0035B3	0.089	1.5	3.16
8600.0	B4	—	202D868X0035B4	0.073	1.2	3.72
10000.0	B5	—	202D109X0035B5	0.062	1.0	4.25
12000.0	B6	—	202D129X0035B6	0.053	0.90	4.84
13000.0	B7	—	202D139X0035B7	0.047	0.79	5.38

* The Part Numbers listed are for \pm 20% tolerance. To specify \pm 10% tolerance, change the digit following "X" from "0" to "9".

TYPE 200D, 202D

EXTENDED RATINGS						
CAPACITANCE (μ F)	CASE CODE	PART NUMBER* TYPE 200D	PART NUMBER* TYPE 202D	Max. ESR @ + 25°C (Ohms)	Max. IMP. @ - 55°C (Ohms)	Max. RMS RIPPLE 120Hz (Amps)
40 WVDC @ + 85°C . . . 25 WVDC @ + 125°C						
1200.0	A1	200D128X0040A1	202D128X0040A1	0.28	5.5	1.13
1500.0	A2	200D158X0040A2	202D158X0040A2	0.22	4.4	1.41
1600.0	D3	—	202D168X0040D3	0.37	5.4	1.03
1800.0	A3	200D188X0040A3	202D188X0040A3	0.18	3.7	1.67
2400.0	A4	200D248X0040A4	202D248X0040A4	0.14	2.8	2.05
3000.0	A5	200D308X0040A5	202D308X0040A5	0.11	2.3	2.54
3300.0	B1	—	202D338X0040B1	0.16	2.8	2.03
4600.0	B2	—	202D468X0040B2	0.11	2.0	2.64
5900.0	B3	—	202D598X0040B3	0.089	1.5	3.16
7300.0	B4	—	202D738X0040B4	0.073	1.2	3.72
8600.0	B5	—	202D868X0040B5	0.062	1.0	4.25
9900.0	B6	—	202D998X0040B6	0.053	0.93	4.84
11000.0	B7	—	202D119X0040B7	0.047	0.81	5.38
50 WVDC @ + 85°C . . . 35 WVDC @ + 125°C						
960.0	A1	200D967X0050A1	202D967X0050A1	0.28	6.1	1.13
1200.0	A2	200D128X0050A2	202D128X0050A2	0.22	4.9	1.14
1300.0	D3	—	202D138X0050D3	0.38	5.5	1.01
1400.0	A3	200D148X0050A3	202D148X0050A3	0.18	4.1	1.67
1900.0	A4	200D198X0050A4	202D198X0050A4	0.14	3.1	2.05
2400.0	A5	200D248X0050A5	202D248X0050A5	0.11	2.5	2.54
2700.0	B1	—	202D278X0050B1	0.16	2.9	2.03
3800.0	B2	—	202D388X0050B2	0.11	2.1	2.64
4900.0	B3	—	202D498X0050B3	0.09	1.6	3.16
5900.0	B4	—	202D598X0050B4	0.073	1.3	3.72
7000.0	B5	—	202D708X0050B5	0.062	1.1	4.25
8100.0	B6	—	202D818X0050B6	0.053	0.97	4.84
9200.0	B7	—	202D928X0050B7	0.047	0.85	5.38
60 WVDC @ + 85°C . . . 40 WVDC @ + 125°C						
800.0	A1	200D807X0060A1	202D807X0060A1	0.28	6.8	1.13
1000.0	A2	200D108X0060A2	202D108X0060A2	0.22	5.4	1.41
1100.0	D3	—	202D118X0060D3	0.38	5.8	1.01
1200.0	A3	200D128X0060A3	202D128X0060A3	0.18	4.5	1.67
1600.0	A4	200D168X0060A4	202D168X0060A4	0.14	3.4	2.05
2000.0	A5	200D208X0060A5	202D208X0060A5	0.11	2.7	2.54
2200.0	B1	—	202D228X0060B1	0.16	2.9	2.03
3100.0	B2	—	202D318X0060B2	0.11	2.1	2.64
4000.0	B3	—	202D408X0060B3	0.09	1.6	3.16
4800.0	B4	—	202D488X0060B4	0.073	1.3	3.72
5700.0	B5	—	202D578X0060B5	0.062	1.1	4.25
6600.0	B6	—	202D668X0060B6	0.053	0.97	4.84
7500.0	B7	—	202D758X0060B7	0.047	0.85	5.38
75 WVDC @ + 85°C . . . 50 WVDC @ + 125°C						
650.0	A1	200D657X0075A1	202D657X0075A1	0.28	7.9	1.13
820.0	A2	200D827X0075A2	202D827X0075A2	0.22	6.3	1.41
880.0	D3	—	202D887X0075D3	0.55	6.0	0.84
980.0	A3	200D987X0075A3	202D987X0075A3	0.18	5.2	1.64
1300.0	A4	200D138X0075A4	202D138X0075A4	0.14	3.9	2.05
1600.0	A5	200D168X0075A5	202D168X0075A5	0.11	3.2	2.54
1800.0	B1	—	202D188X0075B1	0.16	3.0	2.03
2500.0	B2	—	202D258X0075B2	0.11	2.1	2.64
3200.0	B3	—	202D328X0075B3	0.09	1.7	3.16
4000.0	B4	—	202D408X0075B4	0.073	1.4	3.72
4700.0	B5	—	202D478X0075B5	0.062	1.2	4.25
5400.0	B6	—	202D548X0075B6	0.053	1.0	4.84
6100.0	B7	—	202D618X0075B7	0.047	0.88	5.38

* The Part Numbers listed are for \pm 20% tolerance. To specify \pm 10% tolerance, change the digit following "X" from "0" to "9".

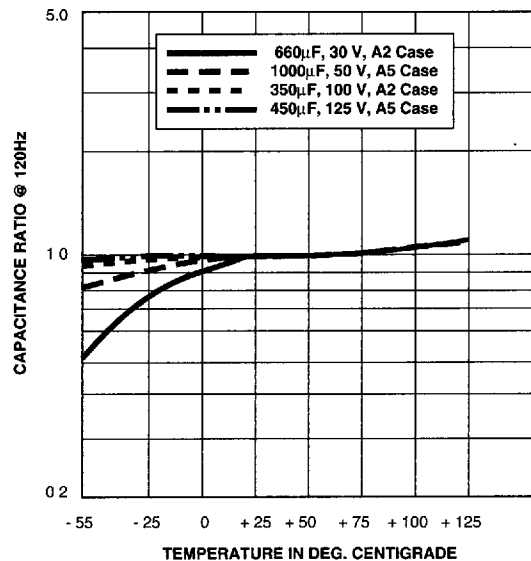
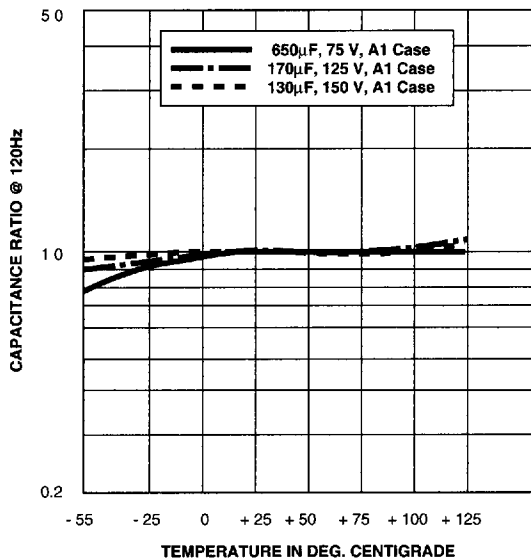
TYPE 200D, 202D

MILITARY SPECIFICATION TANTAPAK® CAPACITOR ASSEMBLIES

CAPACITOR ASSEMBLIES CROSS-REFERENCE

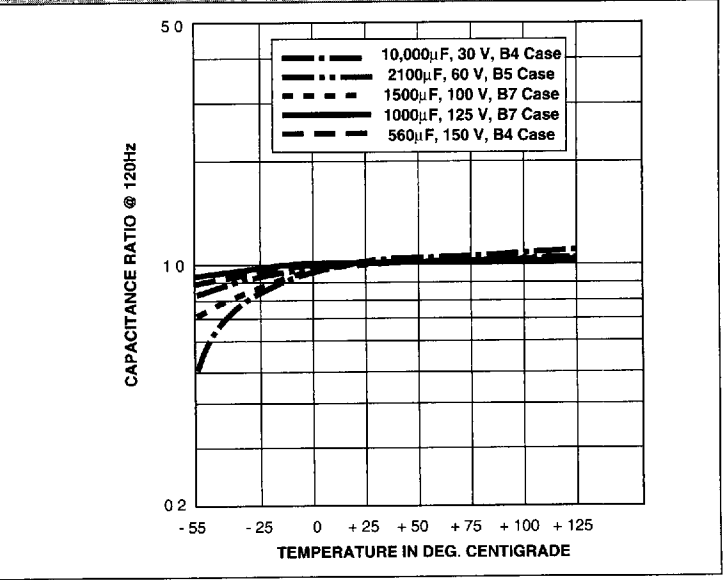
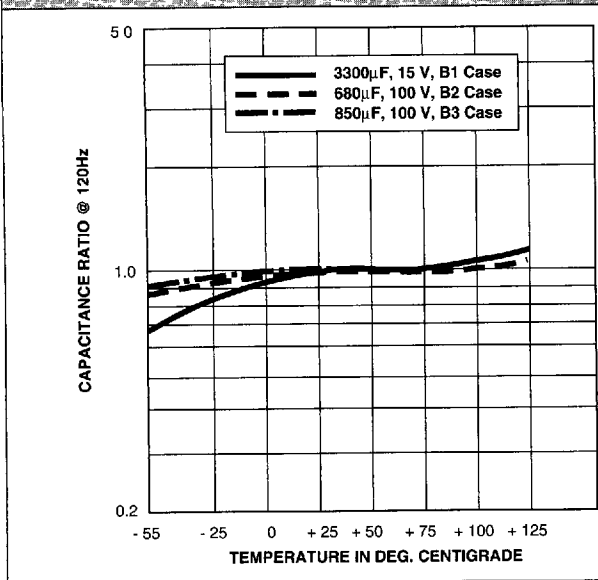
CAPACITANCE (μF)	RATED VOLTAGE @ +85°C	CASE CODE	SPRAGUE® PART NUMBER	CL55 TYPE DESIGNATION
960.0	15	A1	202D967X0015A1	CL55BE961MPG
1200.0	15	A2	202D128X0015A2	CL55BE122MPG
1400.0	15	A3	202D148X0015A3	CL55BE142MPG
2100.0	15	A4	202D218X0015A4	CL55BE212MPG
2400.0	15	A5	202D248X0015A5	CL55BE242MPG
520.0	30	A1	202D527X0030A1	CL55BH521MPG
660.0	30	A2	202D667X0030A2	CL55BH661MPG
820.0	30	A3	202D827X0030A3	CL55BH821MPG
1200.0	30	A4	202D128X0030A4	CL55BH122MPG
1300.0	30	A5	202D138X0030A5	CL55BH132MPG
400.0	50	A1	202D407X0050A1	CL55BJ401MPG
430.0	50	A1	202D437X0050A1	CL55BJ431MPG
500.0	50	A2	202D507X0050A2	CL55BJ501MPG
600.0	50	A3	202D607X0050A3	CL55BJ601MPG
800.0	50	A4	202D807X0050A4	CL55BJ801MPG
1000.0	50	A5	202D108X0050A5	CL55BJ102MPG
270.0	75	A1	202D277X0075A1	CL55BL271MPG
330.0	75	A2	202D337X0075A2	CL55BL331MPG
400.0	75	A3	202D407X0075A3	CL55BL401MPG
600.0	75	A4	202D607X0075A4	CL55BL601MPG
170.0	100	A1	202D177X0100A1	CL55BN171MPG
220.0	100	A2	202D227X0100A2	CL55BN221MPG
260.0	100	A3	202D267X0100A3	CL55BN261MPG
350.0	100	A4	202D357X0100A4	CL55BN351MPG
440.0	100	A5	202D447X0100A5	CL55BN441MPG
70.0	150	A1	202D706X0150A1	CL55BQ700MPG
90.0	150	A2	202D906X0150A2	CL55BQ900MPG
100.0	150	A3	202D107X0150A3	CL55BQ101MPG
140.0	150	A4	202D147X0150A4	CL55BQ141MPG
180.0	150	A5	202D187X0150A5	CL55BQ181MPG

TYPICAL CAPACITANCE RATIO AT 120Hz AS A FUNCTION OF TEMPERATURE

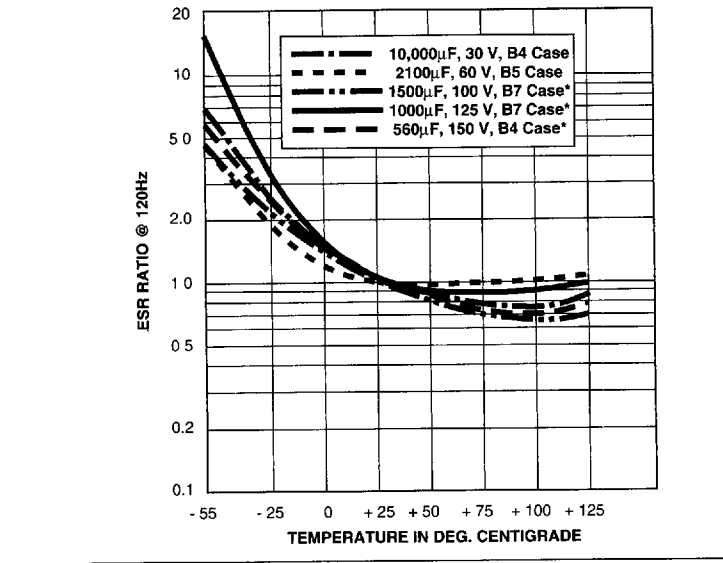
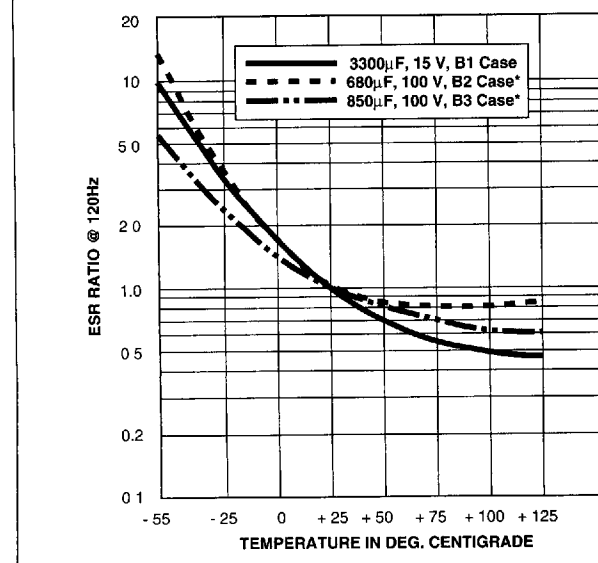
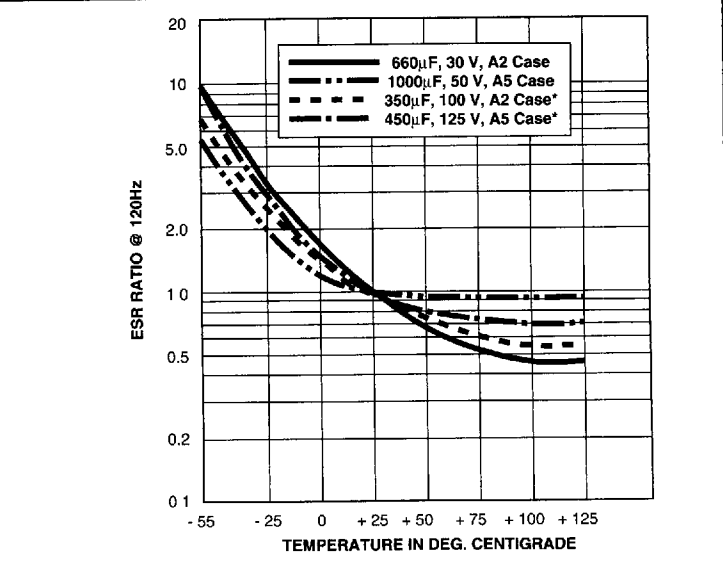
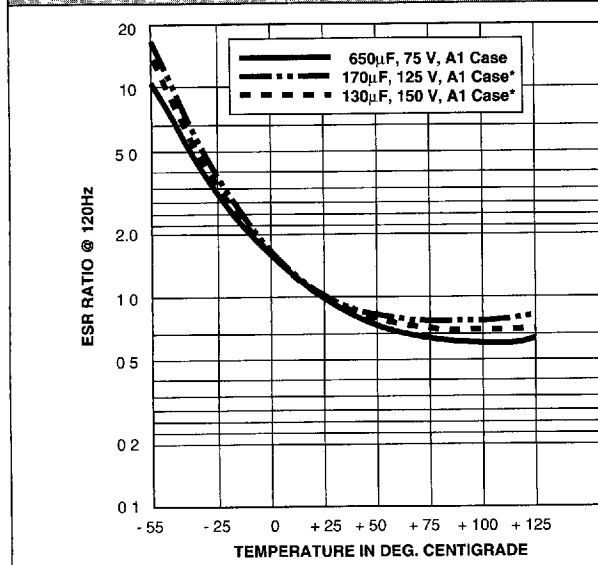


TYPE 200D, 202D

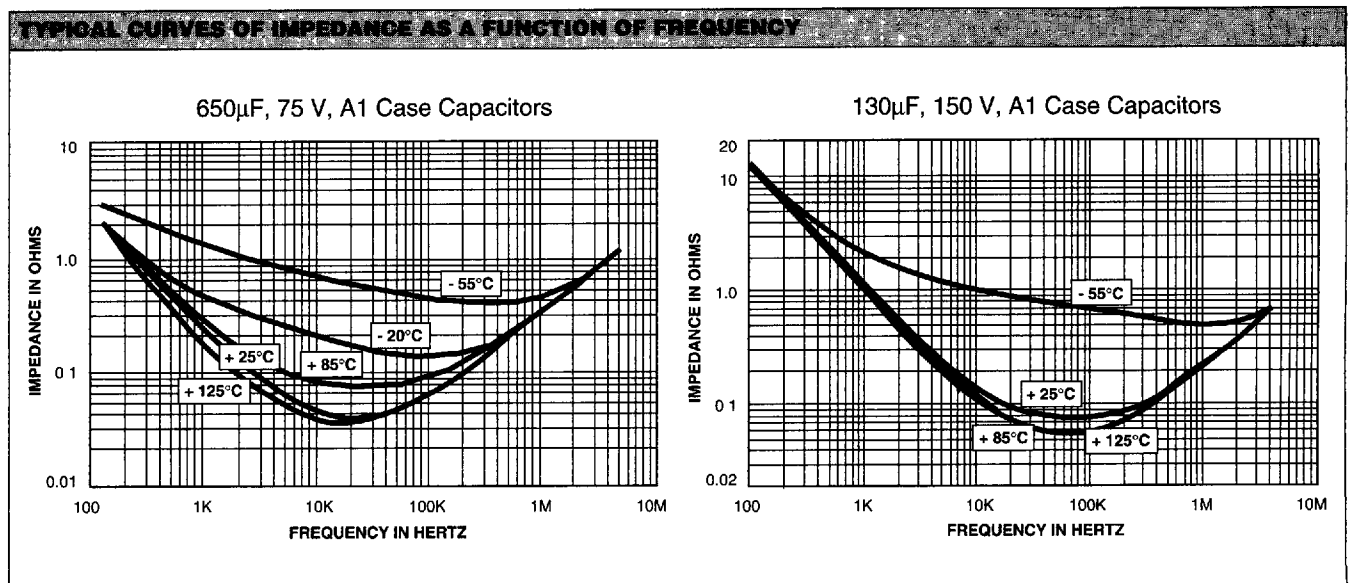
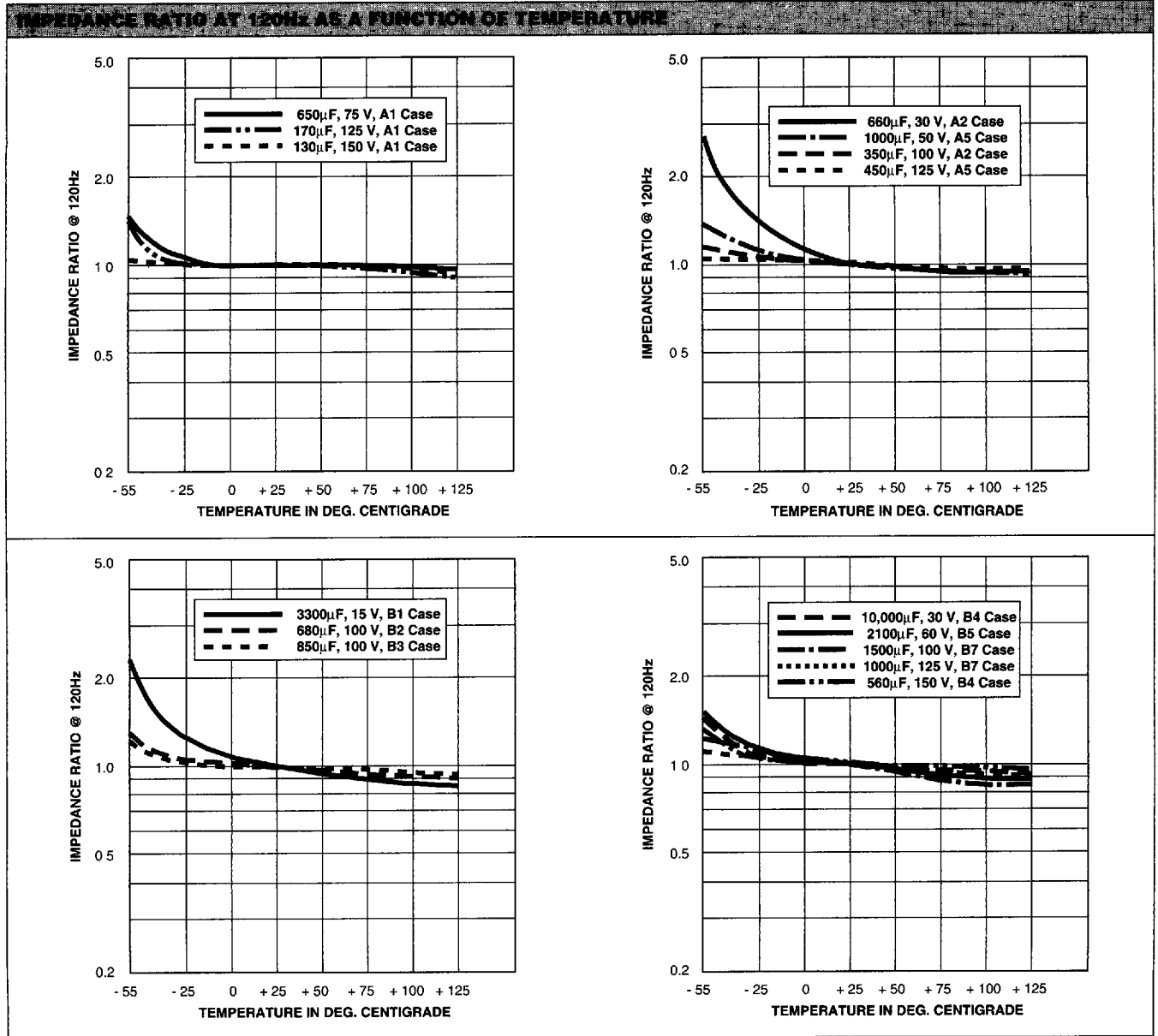
TYPICAL CAPACITANCE RATIO AT 120Hz AS A FUNCTION OF TEMPERATURE



TYPICAL ESR RATIO AS A FUNCTION OF TEMPERATURE



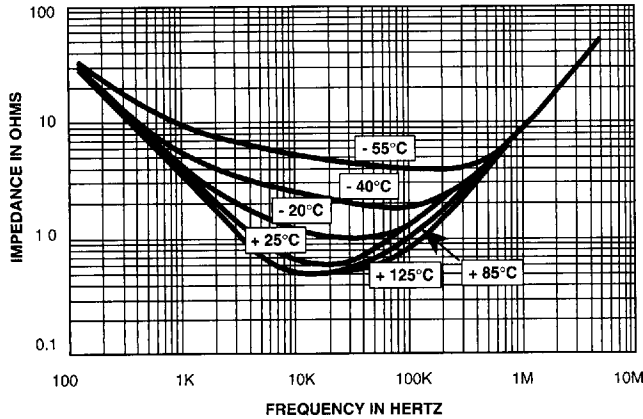
TYPE 200D, 202D



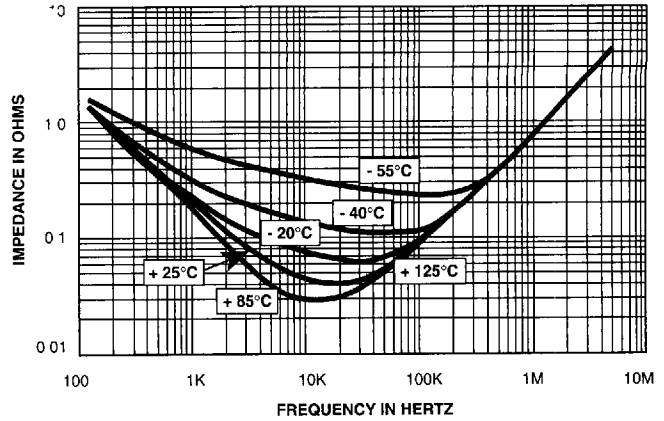
TYPE 200D, 202D

TYPICAL CURVES OF IMPEDANCE AS A FUNCTION OF FREQUENCY

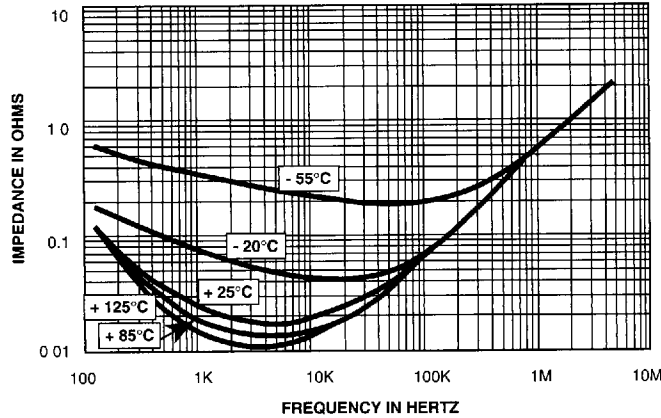
350µF, 100 V, A2 Case Capacitors



850µF, 100 V, B3 Case Capacitors



10,000µF, 30 V, B4 Case Capacitors



PERFORMANCE CHARACTERISTICS

1. **Operating Temperature:** Capacitors are designed to operate over a temperature range of - 55°C to + 125°C.
2. **DC Working Voltage:** The DC working voltage is the maximum operating voltage for continuous duty at the rated temperature.
3. **Surge Voltage:** The surge DC rating is the maximum voltage to which the capacitors should be subjected under any conditions. This includes transients and peak ripple at the highest line voltage.
- 3.1 The surge voltage rating of capacitors rated below 150 volts is 115% of the rated DC working voltage. The surge voltage rating of capacitors rated at 150 volts DC is 165 volts.

- 3.2 **Surge Voltage Test:** Capacitors shall withstand the surge voltage test applied through a series resistor. The value of the resistor shall be determined by the following equation:

$$R \text{ (in ohms)} = \frac{2.2 \times 10^6}{C \text{ (in } \mu\text{F)}} \pm 20\%$$

Example: A capacitor having a value of 10,000µF would require a series resistor with a value of:

$$R = \frac{2.2 \times 10^6}{10,000} = 220 \text{ ohms}$$

TYPE 200D, 202D

PERFORMANCE CHARACTERISTICS (Continued)

- 3.3 Following the surge voltage test, the capacitance at + 25°C shall not have changed by more than 10%; the equivalent series resistance shall not exceed the value shown in the Standard Ratings Table and the leakage current shall not exceed the requirements of Paragraph Number 6 (Leakage Current).
- 3.4 Not more than 1 failure shall be permitted in 12 units tested.
- 4. **Capacitance Tolerance:** The standard tolerance of all capacitors is ± 20% of rated capacitance, unless otherwise specified.
- 4.1 Capacitance measurements shall be made by the bridge method, at or referred to, a frequency of 120Hz at a temperature of + 25°C. A polarizing voltage shall be of such magnitude that there shall be no reversal of polarity due to the AC component. The maximum AC voltage will be 1 volt rms applied during measurement.
- 5. **Equivalent Series Resistance:** Measurements shall be made by the bridge method, at or referred to, a frequency of 120Hz at a temperature of + 25°C. A polarizing voltage shall be used of such magnitude that there shall be no reversal of polarity due to the AC component. The maximum AC voltage will be 1 volt rms applied during measurement.
- 5.1 The equivalent series resistance shall not exceed the maximum value in ohms listed in the Standard Ratings Table.
- 5.2 The dissipation factor can be calculated from the equivalent series resistance and capacitance value as shown:

$$\overline{DF} = \frac{2\pi fRC}{10^4}$$

where:

- DF = Dissipation Factor in %
- R = ESR in ohms
- C = Capacitance in μF
- f = Frequency in Hz
- π = 3.1416

At 120Hz, the above equation becomes:

$$\overline{DF} = \frac{RC}{13.26}$$

For example, the dissipation factor in percent of a 10,000μF, 30 volt capacitor that has a maximum ESR of 0.073 ohms at + 25°C and 120Hz is calculated as follows:

$$DF(\%) = \frac{2 \times 3.1416 \times 120 \times 0.073 \times 10,000}{10^4} = \frac{0.073 \times 10,000}{13.26} = 55.05\%$$

- 6. **Leakage Current:** Measurements shall be made at rated working voltage at + 25°C ± 5°C with an application of a steady source of power, such as a regulated power supply. A 1000 ohm resistor to limit the charging current shall be connected in series with each capacitor under test. Rated working voltage shall be applied to capacitors for 5 minutes before making leakage current measurements.

- 6.1 The maximum leakage current for any capacitor shall not exceed that determined from the formula:

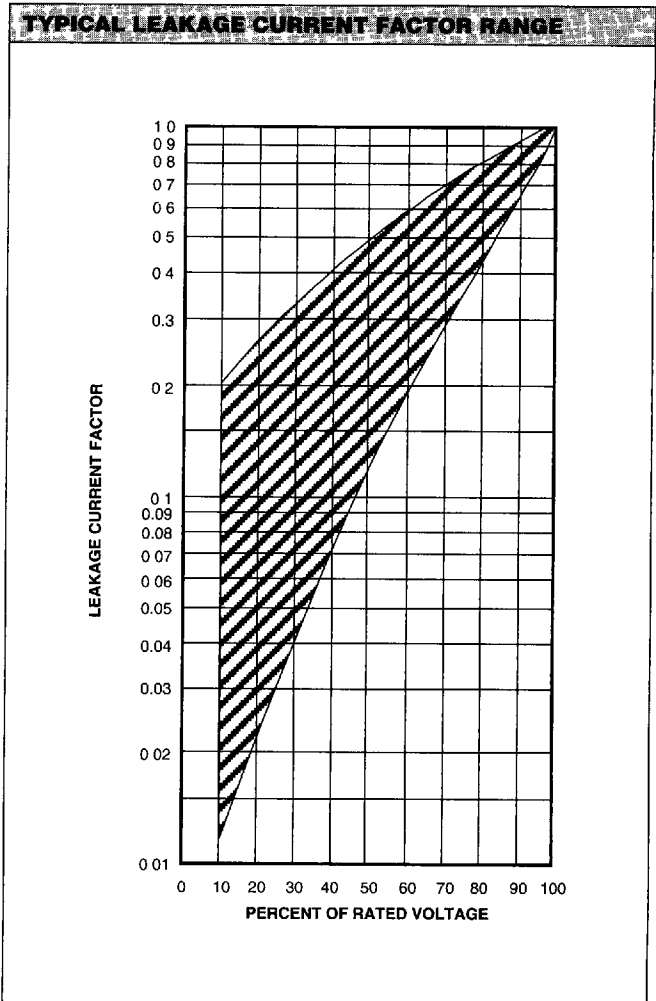
$$I = kCE$$

where:

- I is in microamperes
- C is in microfarads
- E is the rated voltage at the rated maximum temperature
- k is a constant:

Rated Voltage	Operating Temperature		
	+ 25°C ± 5°C	+ 85°C ± 3°C	+ 125°C ± 3°C
< 110 V	0.00025	0.0015	0.0023
≥ 110 V	0.00100	0.0060	0.0090

Note that leakage current varies with applied voltage. See graph below for the appropriate adjustment factor.



- 7. **Low Temperature Impedance:** The impedance value of any capacitor, measured at a temperature of - 55°C and at a frequency of 120Hz, shall not exceed the value given in the Standard Ratings Table.
- 8. **Life Test:** Capacitors shall withstand a 2000 hour life test at a temperature of + 85°C or + 125°C at the rated DC working voltage.

TYPE 200D, 202D

PERFORMANCE CHARACTERISTICS (Continued)

- 8.1 Following the life test, the leakage current shall not exceed the original requirements, the equivalent series resistance shall not be more than 130% of the initial requirement and the capacitance value shall not change by more than $\pm 25\%$.
- 8.2 Not more than 1 failure shall be permitted in 25 units tested.
- 9. **Vibration:**
 - 9.1 **Low Frequency Vibration:** Capacitors shall withstand the low frequency vibration test specified in MIL-STD- 202D, Method 201A, when mounted in suitable test fixtures.
 - 9.2 Following the low frequency vibration test, capacitors shall meet the original requirements for capacitance tolerance, equivalent series resistance and leakage current.
 - 9.3 **High Frequency Vibration:** Capacitors shall withstand the high frequency vibration test specified in MIL-STD-202D, Method 204B, Test Condition D, when mounted in suitable test fixtures.
 - 9.4 Electrical measurements made under these conditions shall show no intermittent contacts, open circuits or short circuits.
 - 9.5 Not more than 1 failure in 12 units tested shall be permitted in either of the vibration tests.
- 10. **Moisture Resistance:** Capacitors shall withstand the moisture resistance test specified in MIL-STD-202, Method 106, after which the following requirements shall be met:
 - 10.1 DC leakage shall not exceed 125% of the value specified.
 - 10.2 Capacitance shall not change more than $\pm 8\%$ from the initial measured value.
 - 10.3 Dissipation factor shall not exceed 15% of the calculated value.
- 11. **Reduced Pressure:** Capacitors shall be stabilized at a reduced atmospheric pressure of 0.82" [20.83] of mercury for a period of 5 minutes. Rated DC voltage shall be applied for 1 minute. Capacitors shall not flash over, nor shall end seals be damaged by this test, nor shall the capacitance, equivalent series resistance or leakage current change.
- 12. **Thermal Cycling:** Capacitors shall be subjected to 30 cycles of thermal cycling in accordance with Military Specification MIL-C-3965.
 - 12.1 Following thermal cycling, capacitors shall meet the following requirements:
 - 12.2 DC leakage shall not exceed 125% of the value specified.
 - 12.3 Capacitance shall change not more than $\pm 5\%$ from the initial measured value.
 - 12.4 Dissipation factor shall not exceed 115% of the calculated value.
 - 12.5 One failure shall be allowed in 12 units tested.
- 13. **Marking:** Capacitors shall be marked with Sprague®, the Sprague® TANTAPAK® trademark, the Sprague® type (200D, 202D), rated capacitance, rated DC working voltage at + 85°C and + 125°C and the standard EIA date code of manufacture.

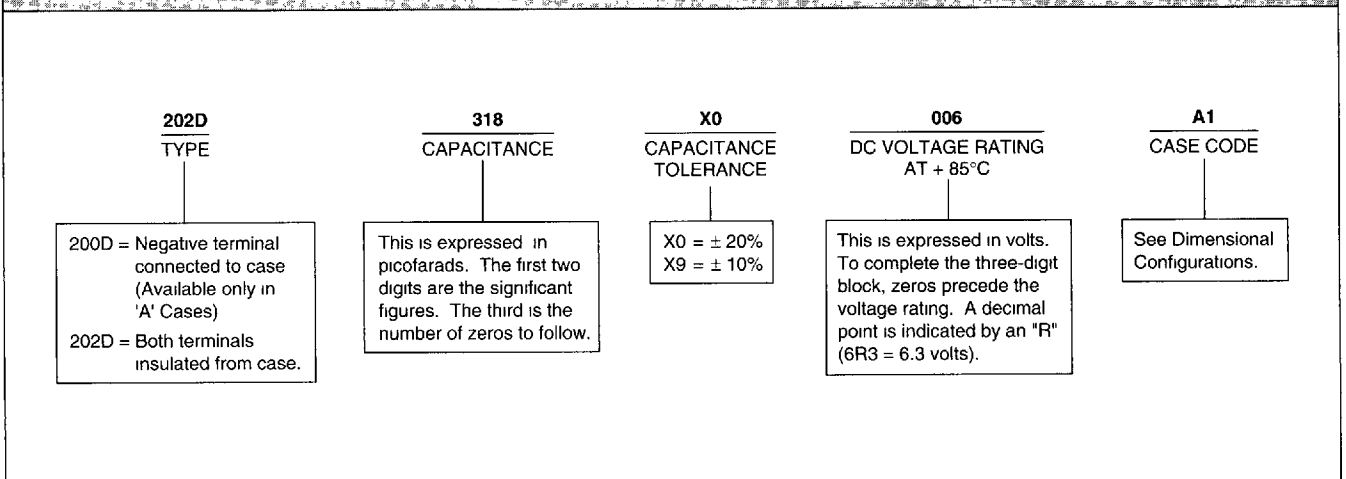
GUIDE TO APPLICATION

- 1. **A-C Ripple Current:** Each capacitor will withstand the rms ripple current shown for that capacitor in the Standard Ratings Table.
 - 1.1 The rms ripple current rating is independent of temperature or frequency within the following limitations:
 - 1.1.1 At frequencies below 120Hz, the rated rms ripple current must be multiplied by the factors shown:

Frequency in Hz	25	50	60	100
Ripple Current Factor	0.36	0.59	0.65	0.88

- 1.1.2 The sum of the peak AC voltage and the DC voltage must not exceed the DC working voltage of the capacitor.
- 1.1.3 The sum of the negative peak AC voltage and the applied DC voltage must not allow a voltage reversal.
- 2. **Storage Life:** A storage life of 10 years or more, with no voltage at room temperature, may be expected.

HOW TO ORDER



TYPE 200D, 202D

CAPACITANCE (μ F)	CASE CODE	WVDC @ + 85°C	MILITARY TYPE DESIGNATION	Max. DISSIPATION FACTOR (%)	Max. IMPEDANCE (Ohms)	Max. DCL (μ A) @	
						+ 25°C	+ 85°C
							+ 125°C
960.0	A1	15	CL55BE961MPG	15	3.10	7.0	58.0
1200.0	A2	15	CL55BE122MPG	15	2.30	9.0	72.0
1400.0	A3	15	CL55BE142MPG	15	1.70	11.0	84.0
2100.0	A4	15	CL55BE212MPG	15	1.30	16.0	126.0
2400.0	A5	15	CL55BE242MPG	15	1.15	18.0	144.0
520.0	A1	30	CL55BH521MPG	15	5.30	8.0	63.0
660.0	A2	30	CL55BH661MPG	15	4.20	10.0	80.0
820.0	A3	30	CL55BH821MPG	15	2.90	13.0	99.0
1200.0	A4	30	CL55BH122MPG	15	2.30	18.0	144.0
1300.0	A5	30	CL55BH132MPG	15	2.10	20.0	156.0
400.0	A1	50	CL55BJ401MPG	15	7.20	10.0	80.0
430.0	A1	50	CL55BJ431MPG	15	6.40	10.0	78.0
500.0	A2	50	CL55BJ501MPG	15	5.60	13.0	100.0
600.0	A3	50	CL55BJ601MPG	15	4.10	15.0	120.0
800.0	A4	50	CL55BJ801MPG	15	3.10	20.0	160.0
1000.0	A5	50	CL55BJ102MPG	15	2.80	23.0	180.0
270.0	A1	75	CL55BL271MPG	12	8.50	9.0	81.0
330.0	A2	75	CL55BL331MPG	12	7.00	12.0	99.0
400.0	A3	75	CL55BL401MPG	12	5.00	15.0	119.0
600.0	A4	75	CL55BL601MPG	12	3.65	23.0	180.0
660.0	A5	75	CL55BL661MPG	12	3.50	25.0	198.0
170.0	A1	100	CL55BN171MPG	12	15.00	9.0	68.0
220.0	A2	100	CL55BN221MPG	12	11.60	11.0	88.0
260.0	A3	100	CL55BN261MPG	12	8.00	13.0	104.0
350.0	A4	100	CL55BN351MPG	12	6.50	18.0	140.0
440.0	A5	100	CL55BN441MPG	12	5.80	22.0	176.0
70.0	A1	150	CL55BQ700MPG	12	28.80	6.0	42.0
90.0	A2	150	CL55BQ900MPG	12	22.40	7.0	54.0
100.0	A3	150	CL55BQ101MPG	12	16.40	8.0	60.0
140.0	A4	150	CL55BQ141MPG	12	12.40	11.0	84.0
180.0	A5	150	CL55BQ181MPG	12	11.20	14.0	104.0

HOW TO ORDER - MILITARY PART NUMBER

CL55 STYLE	B CHARACTERISTIC	E VOLTAGE	961 CAPACITANCE	M CAPACITANCE TOLERANCE	P POLARITY	G SEAL TYPE																												
The style is identified by the two-letter symbol "CL" and refers to tantalum, electrolytic, fixed capacitors. The two-digit number that follows identifies the shape of the capacitor.	B = - 55°C to + 85°C (To + 125°C with voltage derating).	The DC working voltage and surge voltage is indicated by a single letter: <table border="1"> <thead> <tr> <th>Symbol</th> <th>WVDC + 85°C</th> <th>WVDC + 125°C</th> <th>Surge Voltage at + 85°C</th> </tr> </thead> <tbody> <tr><td>E</td><td>15</td><td>10</td><td>17.2</td></tr> <tr><td>H</td><td>30</td><td>20</td><td>34.5</td></tr> <tr><td>J</td><td>50</td><td>30</td><td>57.5</td></tr> <tr><td>L</td><td>75</td><td>50</td><td>86.2</td></tr> <tr><td>N</td><td>100</td><td>65</td><td>115.0</td></tr> <tr><td>Q</td><td>150</td><td>100</td><td>172.0</td></tr> </tbody> </table>	Symbol	WVDC + 85°C	WVDC + 125°C	Surge Voltage at + 85°C	E	15	10	17.2	H	30	20	34.5	J	50	30	57.5	L	75	50	86.2	N	100	65	115.0	Q	150	100	172.0	This is expressed in microfarads. The first two digits are the significant figures. The third is the number of zeros to follow. When fractional values of a microfarad are expressed, the letter "R" is used to indicate the decimal point and the last digit becomes significant. For example: 3R5 = 3.5 μ F.	M = \pm 20%.	P = Polarized.	G = Hermetic.
Symbol	WVDC + 85°C	WVDC + 125°C	Surge Voltage at + 85°C																															
E	15	10	17.2																															
H	30	20	34.5																															
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