Product Change Notification

EOL of CDE Series –SH, SN, SS, SXR

Description of Change:
With this PCN we want to inform about the EOL of the Radial Leaded Aluminum Electrolytic Capacitors Series

Reason for Change: Change in strategic market focus

Part Number/Series/Families Affected: All part numbers
Data Sheets: See Attached

Re-Buys: Through March 31, 2018

Possible Replacement Series: N/A

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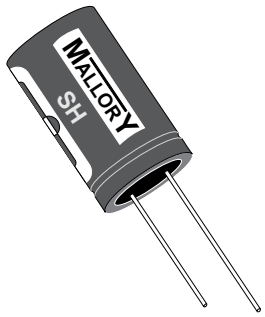
Type SH 105 ºC Radial Leaded Aluminum Electrolytic Capacitors

2000 Hour Long Life, Aluminum Electrolytic



Type SH is a radial leaded aluminum electrolytic capacitor with a +105 ºC, 2000 hour long life rating. The SH is a high reliability product and is ideal for high quality applications that require long life in high temperatures environments.

Highlights

- +105 ºC
- 2000 hours - long life
- High reliability
- Available in T&R and ammo pack

Specifications

RoHS Compliant

Complies with the EU Directive 2002/95/EC requirement restricting the use of Lead (Pb), Mercury (Hg), Cadmium (Cd), Hexavalent chromium (Cr(VI)), PolyBrominated Biphenyls (PBB) and PolyBrominated Diphenyl Ethers (PBDE).

Capacitance Range: 1.0 to 4700 µF

Voltage Range: 6.3 to 450 Vdc

Capacitance Tolerance: ±20%

Operating Temperature Range: –40 ºC to +105 ºC (–25 ºC for 160 to 450 Vdc)

DC Leakage Current: After 2 minutes, 25 ºC at rated voltage

6.3 to 100 Vdc

I = .01CV + 3 µA Max

≥ 160 Vdc after voltage applied for 3 minutes

I = .03CV + 10 µA Max

C = Capacitance in (µF)

V = Rated voltage

I = Leakage current in µA

Dissipation Factor @ 120 Hz, +25 ºC:

WV (V)	6.3	10	16	25	35	50	63	100	160-250	400-450
DF(%)	26	22	18	16	14	12	10	10	15	20

Above 1000 µF, the value of DF (%) is increased 2% for every additional 1000 µF

Ripple Multipliers for Frequency and Temperature:

Rated WVDC	Ripple Multipliers			
	60Hz	120Hz	1kHz	10kHz
6 to 25	0.80	1.0	1.1	1.2
35 to 100	0.75	1.0	1.3	1.4
160 to 450	0.70	1.0	1.4	1.6

Ambient Temperature	Ripple Multiplier
+105 ºC	1.00
+85 ºC	1.50
+70 ºC	1.80

Load Life Test: Apply Rated WVDC for 2000 hours at +105 ºC

Capacitance change within 20% of initial value

DF not to exceed 200% of initial requirement

DC Leakage current meets initial limits

Shelf Life: 1000 hrs @105 ºC with no voltage applied

Cap change within 20% of initial value

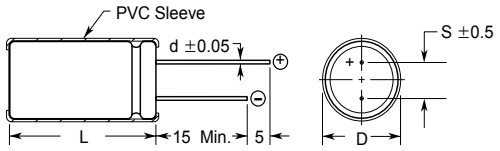
DF ≤ 200% of initial requirements

DC leakage current meets initial requirement

Type SH 105 ºC Radial Leaded Aluminum Electrolytic Capacitors

Outline Drawing

Outline Dimensions
(Millimeters)



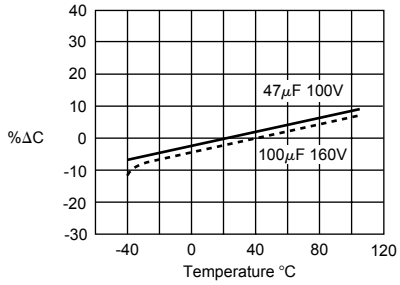
Case vented on diameters 6.3 and greater

Vinyl sleeve adds .5 Max. to diameter and 2.0 Max. to length

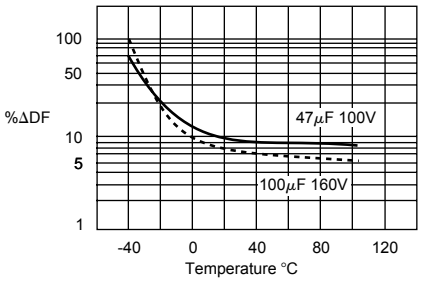
Part Numbering System

SH	100	M	100	S	T
Type	Capacitance (µF)	Capacitance Tolerance (%)	Rated Voltage (Vdc)	Packaging	Lead Configuration
SH	1R0 = 1	K = ±10	6R3 = 6.3	A = Tape & Ammo	1 = Lead cut
	100 = 10	M = ±20	010 = 10	E = Different Characteristic	2 = Lead form
	101 = 100		100 = 100	R = Tape & Reel	4 = Lead crimp & cut (form)
	102 = 1000			S = Standard	T = Standard

Temperature Characteristics

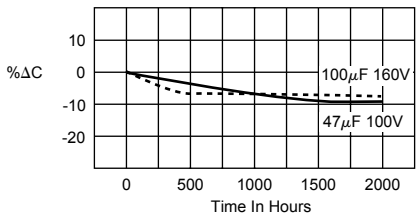


Capacitance Change Ratio

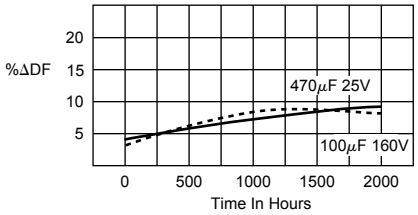


Dissipation Factor Change

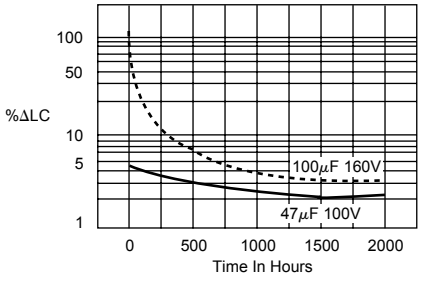
Load Life Characteristics



Capacitance Change Ratio



Dissipation Factor Change



Leakage Current Change

Type SH 105 °C Radial Leaded Aluminum Electrolytic Capacitors

Ratings

Capacitance (uF)	Catalog Part Number	ESR 120 Hz/+25°C (ohms)	Max Ripple Current 120 Hz/ +105°C (ma)	Size in. (mm)							
				Diameter (D)		Length (L)		Lead Space (S)		Lead dia. (d)	
6.3 Vdc (8 Volts Surge)											
47	SH470M6R3ST	7.34	65	0.197	(5.0)	0.433	(11.0)	0.079	(2.0)	0.020	(0.5)
100	SH101M6R3ST	3.45	100	0.197	(5.0)	0.433	(11.0)	0.079	(2.0)	0.020	(0.5)
220	SH221M6R3ST	1.57	165	0.248	(6.3)	0.433	(11.0)	0.098	(2.5)	0.020	(0.5)
330	SH331M6R3ST	1.04	200	0.315	(8.0)	0.433	(11.0)	0.138	(3.5)	0.024	(0.6)
470	SH471M6R3ST	0.73	280	0.315	(8.0)	0.433	(11.0)	0.138	(3.5)	0.024	(0.6)
1000	SH102M6R3ST	0.34	470	0.394	(10.0)	0.492	(12.5)	0.197	(5.0)	0.024	(0.6)
2200	SH222M6R3ST	0.17	930	0.512	(13.0)	0.787	(20.0)	0.197	(5.0)	0.024	(0.6)
3300	SH332M6R3ST	0.12	1100	0.512	(13.0)	0.787	(20.0)	0.197	(5.0)	0.024	(0.6)
4700	SH472M6R3ST	0.09	1320	0.630	(16.0)	0.984	(25.0)	0.295	(7.5)	0.031	(0.8)
10 Vdc (13 Volts Surge)											
47	SH470M010ST	6.21	75	0.197	(5.0)	0.433	(11.0)	0.079	(2.0)	0.020	(0.5)
100	SH101M010ST	2.92	110	0.197	(5.0)	0.433	(11.0)	0.079	(2.0)	0.020	(0.5)
220	SH221M010ST	1.33	180	0.248	(6.3)	0.433	(11.0)	0.098	(2.5)	0.020	(0.5)
330	SH331M010ST	0.88	255	0.315	(8.0)	0.433	(11.0)	0.138	(3.5)	0.024	(0.6)
470	SH471M010ST	0.62	305	0.315	(8.0)	0.433	(11.0)	0.138	(3.5)	0.024	(0.6)
1000	SH102M010ST	0.29	570	0.394	(10.0)	0.630	(16.0)	0.197	(5.0)	0.024	(0.6)
2200	SH222M010ST	0.14	1010	0.512	(13.0)	0.787	(20.0)	0.197	(5.0)	0.024	(0.6)
3300	SH332M010ST	0.10	1220	0.512	(13.0)	0.984	(25.0)	0.197	(5.0)	0.024	(0.6)
4700	SH472M010ST	0.08	1410	0.630	(16.0)	0.984	(25.0)	0.295	(7.5)	0.031	(0.8)
16 Vdc (20 Volts Surge)											
33	SH330M016ST	7.23	70	0.197	(5.0)	0.433	(11.0)	0.079	(2.0)	0.020	(0.5)
47	SH470M016ST	5.08	85	0.197	(5.0)	0.433	(11.0)	0.079	(2.0)	0.020	(0.5)
100	SH101M016ST	2.39	135	0.248	(6.3)	0.433	(11.0)	0.098	(2.5)	0.020	(0.5)
220	SH221M016ST	1.09	235	0.315	(8.0)	0.433	(11.0)	0.138	(3.5)	0.024	(0.6)
330	SH331M016ST	0.72	285	0.315	(8.0)	0.433	(11.0)	0.138	(3.5)	0.024	(0.6)
470	SH471M016ST	0.51	395	0.394	(10.0)	0.492	(12.5)	0.197	(5.0)	0.024	(0.6)
1000	SH102M016ST	0.24	700	0.394	(10.0)	0.787	(20.0)	0.197	(5.0)	0.024	(0.6)
2200	SH222M016ST	0.12	1150	0.512	(13.0)	0.984	(25.0)	0.197	(5.0)	0.024	(0.6)
3300	SH332M016ST	0.09	1350	0.630	(16.0)	0.984	(25.0)	0.295	(7.5)	0.031	(0.8)
4700	SH472M016ST	0.07	1560	0.630	(16.0)	1.26	(32.0)	0.295	(7.5)	0.031	(0.8)
25 Vdc (32 Volts Surge)											
10	SH100M025ST	21.22	39	0.197	(5.0)	0.433	(11.0)	0.079	(2.0)	0.020	(0.5)
22	SH220M025ST	9.65	60	0.197	(5.0)	0.433	(11.0)	0.079	(2.0)	0.020	(0.5)
33	SH330M025ST	6.43	75	0.197	(5.0)	0.433	(11.0)	0.079	(2.0)	0.020	(0.5)
47	SH470M025ST	4.52	90	0.197	(5.0)	0.433	(11.0)	0.079	(2.0)	0.020	(0.5)
100	SH101M025ST	2.12	145	0.248	(6.3)	0.433	(11.0)	0.098	(2.5)	0.020	(0.5)
220	SH221M025ST	0.96	250	0.394	(10.0)	0.492	(12.5)	0.197	(5.0)	0.024	(0.6)
330	SH331M025ST	0.64	355	0.394	(10.0)	0.492	(12.5)	0.197	(5.0)	0.024	(0.6)
470	SH471M025ST	0.45	470	0.394	(10.0)	0.630	(16.0)	0.197	(5.0)	0.024	(0.6)
1000	SH102M025ST	0.21	855	0.512	(13.0)	0.787	(20.0)	0.197	(5.0)	0.024	(0.6)
2200	SH222M025ST	0.11	1230	0.630	(16.0)	0.984	(25.0)	0.295	(7.5)	0.031	(0.8)
3300	SH332M025ST	0.08	1450	0.630	(16.0)	1.26	(32.0)	0.295	(7.5)	0.031	(0.8)
4700	SH472M025ST	0.06	1690	0.709	(18.0)	1.40	(36.0)	0.295	(7.5)	0.031	(0.8)

Type SH 105 ºC Radial Leaded Aluminum Electrolytic Capacitors

Ratings

Capacitance (uF)	Catalog Part Number	ESR 120 Hz/+25°C (ohms)	Max Ripple Current 120 Hz/ +105°C (ma)	Size in. (mm)							
				Diameter (D)		Length (L)		Lead Space (S)		Lead dia. (d)	
35 Vdc (44 Volts Surge)											
10	SH100M035ST	18.57	40	0.197	(5.0)	0.433	(11.0)	0.079	(2.0)	0.020	(0.5)
22	SH220M035ST	8.44	65	0.248	(6.3)	0.433	(11.0)	0.098	(2.5)	0.020	(0.5)
33	SH330M035ST	5.63	85	0.248	(6.3)	0.433	(11.0)	0.098	(2.5)	0.020	(0.5)
47	SH470M035ST	3.95	115	0.248	(6.3)	0.433	(11.0)	0.098	(2.5)	0.020	(0.5)
100	SH101M035ST	1.86	190	0.315	(8.0)	0.433	(11.0)	0.138	(3.5)	0.024	(0.6)
220	SH221M035ST	0.84	315	0.394	(10.0)	0.492	(12.5)	0.197	(5.0)	0.024	(0.6)
330	SH331M035ST	0.56	440	0.394	(10.0)	0.630	(16.0)	0.197	(5.0)	0.024	(0.6)
470	SH471M035ST	0.40	580	0.512	(13.0)	0.787	(20.0)	0.197	(5.0)	0.024	(0.6)
1000	SH102M035ST	0.19	995	0.512	(13.0)	0.984	(25.0)	0.197	(5.0)	0.024	(0.6)
2200	SH222M035ST	0.10	1450	0.630	(16.0)	1.26	(32.0)	0.295	(7.5)	0.031	(0.8)
3300	SH332M035ST	0.07	1660	0.709	(18.0)	1.40	(36.0)	0.295	(7.5)	0.031	(0.8)
50 Vdc (63 Volts Surge)											
1	SH010M050ST	159.15	12	0.197	(5.0)	0.433	(11.0)	0.079	(2.0)	0.020	(0.5)
2.2	SH2R2M050ST	72.34	18	0.197	(5.0)	0.433	(11.0)	0.079	(2.0)	0.020	(0.5)
3.3	SH3R3M050ST	48.23	25	0.197	(5.0)	0.433	(11.0)	0.079	(2.0)	0.020	(0.5)
4.7	SH4R7M050ST	33.86	30	0.197	(5.0)	0.433	(11.0)	0.079	(2.0)	0.020	(0.5)
10	SH100M050ST	15.92	50	0.197	(5.0)	0.433	(11.0)	0.079	(2.0)	0.020	(0.5)
22	SH220M050ST	7.23	75	0.197	(5.0)	0.433	(11.0)	0.079	(2.0)	0.020	(0.5)
33	SH330M050ST	4.82	105	0.248	(6.3)	0.433	(11.0)	0.098	(2.5)	0.020	(0.5)
47	SH470M050ST	3.39	125	0.315	(8.0)	0.433	(11.0)	0.138	(3.5)	0.024	(0.6)
100	SH101M050ST	1.59	210	0.394	(10.0)	0.492	(12.5)	0.197	(5.0)	0.024	(0.6)
220	SH221M050ST	0.72	400	0.394	(10.0)	0.630	(16.0)	0.197	(5.0)	0.024	(0.6)
330	SH331M050ST	0.48	535	0.394	(10.0)	0.787	(20.0)	0.197	(5.0)	0.024	(0.6)
470	SH471M050ST	0.34	730	0.512	(13.0)	0.787	(20.0)	0.197	(5.0)	0.024	(0.6)
1000	SH102M050ST	0.16	1110	0.630	(16.0)	0.984	(25.0)	0.295	(7.5)	0.031	(0.8)
2200	SH222M050ST	0.08	1530	0.709	(18.0)	1.40	(36.0)	0.295	(7.5)	0.031	(0.8)
63 Vdc (79 Volts Surge)											
4.7	SH4R7M063ST	28.22	34	0.197	(5.0)	0.433	(11.0)	0.079	(2.0)	0.020	(0.5)
10	SH100M063ST	13.26	55	0.197	(5.0)	0.433	(11.0)	0.079	(2.0)	0.020	(0.5)
22	SH220M063ST	6.03	90	0.248	(6.3)	0.433	(11.0)	0.098	(2.5)	0.020	(0.5)
33	SH330M063ST	4.02	110	0.315	(8.0)	0.433	(11.0)	0.138	(3.5)	0.024	(0.6)
47	SH470M063ST	2.82	155	0.315	(8.0)	0.433	(11.0)	0.138	(3.5)	0.024	(0.6)
100	SH101M063ST	1.33	260	0.394	(10.0)	0.492	(12.5)	0.197	(5.0)	0.024	(0.6)
220	SH221M063ST	0.60	460	0.394	(10.0)	0.787	(20.0)	0.197	(5.0)	0.024	(0.6)
330	SH331M063ST	0.40	650	0.512	(13.0)	0.787	(20.0)	0.197	(5.0)	0.024	(0.6)
470	SH471M063ST	0.28	800	0.512	(13.0)	0.984	(25.0)	0.197	(5.0)	0.024	(0.6)
1000	SH102M063ST	0.13	1200	0.630	(16.0)	1.26	(32.0)	0.295	(7.5)	0.031	(0.8)
100 Vdc (125 Volts Surge)											
1	SH010M100ST	132.63	15	0.197	(5.0)	0.433	(11.0)	0.079	(2.0)	0.020	(0.5)
2.2	SH2R2M100ST	60.29	22	0.197	(5.0)	0.433	(11.0)	0.079	(2.0)	0.020	(0.5)
3.3	SH3R3M100ST	40.19	29	0.197	(5.0)	0.433	(11.0)	0.079	(2.0)	0.020	(0.5)
4.7	SH4R7M100ST	28.22	37	0.197	(5.0)	0.433	(11.0)	0.079	(2.0)	0.020	(0.5)
10	SH100M100ST	13.26	65	0.248	(6.3)	0.433	(11.0)	0.098	(2.5)	0.020	(0.5)
22	SH220M100ST	6.03	115	0.315	(8.0)	0.433	(11.0)	0.138	(3.5)	0.024	(0.6)

Type SH 105 ºC Radial Leaded Aluminum Electrolytic Capacitors

Ratings

Capacitance (uF)	Catalog Part Number	ESR 120 Hz/+25°C (ohms)	Max Ripple Current 120 Hz/ +105°C (ma)	Size in. (mm)							
				Diameter (D)		Length (L)		Lead Space (S)		Lead dia. (d)	
100 Vdc (125 Volts Surge)											
33	SH330M100ST	4.02	160	0.394	(10.0)	0.492	(12.5)	0.197	(5.0)	0.024	(0.6)
47	SH470M100ST	2.82	210	0.394	(10.0)	0.630	(16.0)	0.197	(5.0)	0.024	(0.6)
100	SH101M100ST	1.33	385	0.512	(13.0)	0.787	(20.0)	0.197	(5.0)	0.024	(0.6)
220	SH221M100ST	0.60	590	0.630	(16.0)	0.984	(25.0)	0.295	(7.5)	0.031	(0.8)
330	SH331M100ST	0.40	720	0.630	(16.0)	0.984	(25.0)	0.295	(7.5)	0.031	(0.8)
470	SH471M100ST	0.28	875	0.630	(16.0)	1.26	(32.0)	0.295	(7.5)	0.031	(0.8)
***160 Vdc (200 Volts Surge)**											
1	SH010M160ST	198.94	17	0.197	(5.0)	0.433	(11.0)	0.079	(2.0)	0.020	(0.5)
2.2	SH2R2M160ST	90.43	25	0.248	(6.3)	0.433	(11.0)	0.098	(2.5)	0.020	(0.5)
3.3	SH3R3M160ST	60.29	36	0.315	(8.0)	0.433	(11.0)	0.138	(3.5)	0.024	(0.6)
4.7	SH4R7M160ST	42.33	43	0.315	(8.0)	0.433	(11.0)	0.138	(3.5)	0.024	(0.6)
10	SH100M160ST	19.89	70	0.394	(10.0)	0.492	(12.5)	0.197	(5.0)	0.024	(0.6)
22	SH220M160ST	9.04	130	0.394	(10.0)	0.787	(20.0)	0.197	(5.0)	0.024	(0.6)
33	SH330M160ST	6.03	180	0.512	(13.0)	0.787	(20.0)	0.197	(5.0)	0.024	(0.6)
47	SH470M160ST	4.23	270	0.512	(13.0)	0.984	(25.0)	0.197	(5.0)	0.024	(0.6)
100	SH101M160ST	1.99	330	0.630	(16.0)	0.984	(25.0)	0.295	(7.5)	0.031	(0.8)
***200 Vdc (250 Volts Surge)**											
1	SH010M200ST	198.94	17	0.248	(6.3)	0.433	(11.0)	0.098	(2.5)	0.020	(0.5)
2.2	SH2R2M200ST	90.43	25	0.248	(6.3)	0.433	(11.0)	0.098	(2.5)	0.020	(0.5)
3.3	SH3R3M200ST	60.29	36	0.315	(8.0)	0.433	(11.0)	0.138	(3.5)	0.024	(0.6)
4.7	SH4R7M200ST	42.33	50	0.394	(10.0)	0.492	(12.5)	0.197	(5.0)	0.024	(0.6)
10	SH100M200ST	19.89	80	0.394	(10.0)	0.630	(16.0)	0.197	(5.0)	0.024	(0.6)
22	SH220M200ST	9.04	140	0.394	(10.0)	0.787	(20.0)	0.197	(5.0)	0.024	(0.6)
33	SH330M200ST	6.03	190	0.512	(13.0)	0.984	(25.0)	0.197	(5.0)	0.024	(0.6)
47	SH470M200ST	4.23	220	0.512	(13.0)	0.984	(25.0)	0.197	(5.0)	0.024	(0.6)
100	SH101M200ST	1.99	335	0.630	(16.0)	1.26	(32.0)	0.295	(7.5)	0.031	(0.8)
***250 Vdc (300 Volts Surge)**											
1	SH010M250ST	198.94	17	0.248	(6.3)	0.433	(11.0)	0.098	(2.5)	0.020	(0.5)
2.2	SH2R2M250ST	90.43	29	0.315	(8.0)	0.433	(11.0)	0.138	(3.5)	0.024	(0.6)
3.3	SH3R3M250ST	60.29	42	0.394	(10.0)	0.492	(12.5)	0.197	(5.0)	0.024	(0.6)
4.7	SH4R7M250ST	42.33	50	0.394	(10.0)	0.492	(12.5)	0.197	(5.0)	0.024	(0.6)
10	SH100M250ST	19.89	88	0.394	(10.0)	0.787	(20.0)	0.197	(5.0)	0.024	(0.6)
22	SH220M250ST	9.04	155	0.512	(13.0)	0.984	(25.0)	0.197	(5.0)	0.024	(0.6)
33	SH330M250ST	6.03	190	0.512	(13.0)	0.984	(25.0)	0.197	(5.0)	0.024	(0.6)
47	SH470M250ST	4.23	230	0.630	(16.0)	0.984	(25.0)	0.295	(7.5)	0.031	(0.8)
100	SH101M250ST	1.99	340	0.709	(18.0)	1.40	(36.0)	0.295	(7.5)	0.031	(0.8)
***400 Vdc (450 Volts Surge)**											
22	SH220M400ST	12.06	110	0.630	(16.0)	0.984	(25.0)	0.295	(7.5)	0.031	(0.8)
***450 Vdc (500 Volts Surge)**											
10	SH100M450ST	26.53	80	0.512	(13.0)	0.984	(25.0)	0.197	(5.0)	0.024	(0.6)

* Over 160 Vdc the ripple is measured at 85 ºC

Type SH 105 ºC Radial Leaded Aluminum Electrolytic Capacitors

Taping & Packaging

Fig. 1 - Formed Taping

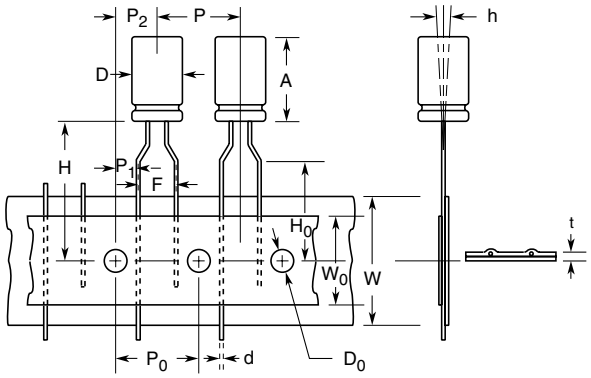


Fig. 2 - Straight Taping (5Φ, 6.3Φ, 8Φ)

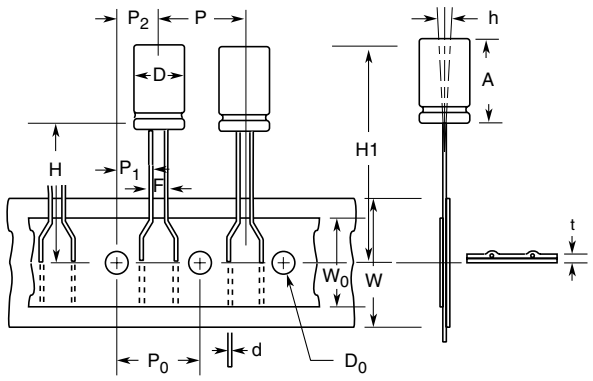


Fig. 3- Straight Taping (Under 10Φ, 12Φ, 13Φ)

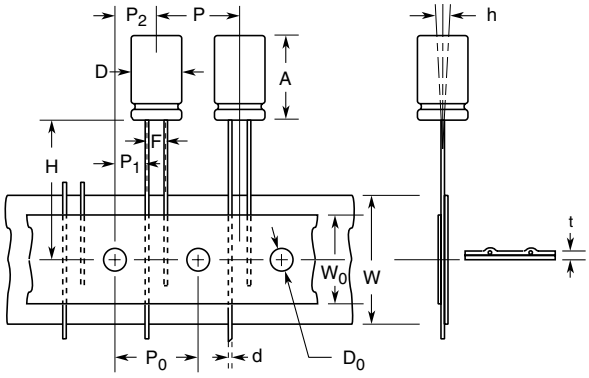
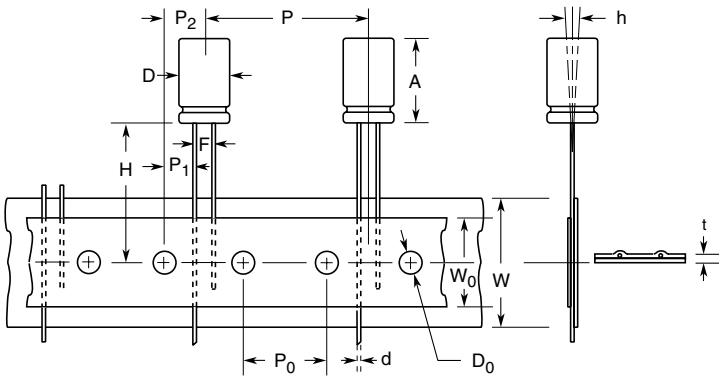


Fig. 4- Straight Taping (16Φ, 18Φ)

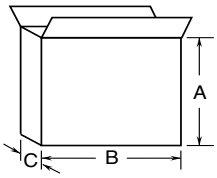


Standard Lead Spacing of Taped Components is 5mm
Other Lead Spacing is Available by Special Order

Code	D	A	d	P	P_0	P_1	P_2	F	W	W_0	H	H_0	D_0	t	ih	Fig.
Tolerance	0.5	1.0	±0.05	±1.0	±0.2	±0.7	±1.3	+0.8 -0.2	±0.5	Min.	±0.75	±0.5	±0.2	±0.2	Max.	
Item	4 ~ 6.3	7.0	0.45	12.7	12.7	3.85	6.35	5.0	18.0	12.5	18.5	16.0	4.0	0.7	2.0	1
	5 ~ 8	12.5	0.5	12.7	12.7	3.85	6.35	5.0	18.0	12.5	18.5	16.0	4.0	0.7	2.0	
	5, 6.3	12.5	0.5	12.7	12.7	5.1	6.35	2.5	18.0	12.5	18.5	——	4.0	0.7	2.0	2
	8	12.5	0.5	12.7	12.7	4.6	6.35	3.5	18.0	12.5	18.5	——	4.0	0.7	2.0	
	10	21.0	0.6	12.7	12.7	3.85	6.35	5.0	18.0	12.5	18.5	——	4.0	0.7	2.0	3
	12, 13	26.0	0.6	15.0	15.0	5.0	7.5	5.0	18.0	12.5	18.5	——	4.0	0.7	2.0	
	16, 18	26.0	0.8	30.0	15.0	3.75	7.5	7.5	18.0	12.5	18.0	——	4.0	0.7	2.0	4

Capacitor Diameter D (mm)	Ammo Pack Box Dimensions (mm)			Quantity Per Ammo Pack Box
	A±5	B Max	C±3	
4	250	340	54	3000
5	250	340	54	2,000
6.3	290	340	54	2,000
8	250	340	54	1,000
10 (12 L)	290	340	54	600
10 (16 L)	350	340	59	600
10 (20 L)	340	340	71	600
12, 13	340	340	71	400
16	340	340	71	300

Ammo Pack



Ammo Pack boxes are shipped 5 to the outer packing carton

Tape And Reel Quantities

Case Diameter D (mm)	Reel Width	Reel Qty. (Pcs.)
4	44	1500
5	44	1200
6	44	1000
8	44	800
10 (12L)	44	600
10 (16L)	50	600
12, 13	-	-
16		

Notice and Disclaimer: All product drawings, descriptions, specifications, statements, information and data (collectively, the "Information") in this datasheet or other publication are subject to change. The customer is responsible for checking, confirming and verifying the extent to which the Information contained in this datasheet or other publication is applicable to an order at the time the order is placed. All Information given herein is believed to be accurate and reliable, but it is presented without any guarantee, warranty, representation or responsibility of any kind, expressed or implied. Statements of suitability for certain applications are based on the knowledge that the Cornell Dubilier company providing such statements ("Cornell Dubilier") has of operating conditions that such Cornell Dubilier company regards as typical for such applications, but are not intended to constitute any guarantee, warranty or representation regarding any such matter – and Cornell Dubilier specifically and expressly disclaims any guarantee, warranty or representation concerning the suitability for a specific customer application, use, storage, transportation, or operating environment. The Information is intended for use only by customers who have the requisite experience and capability to determine the correct products for their application. Any technical advice inferred from this Information or otherwise provided by Cornell Dubilier with reference to the use of any Cornell Dubilier products is given gratis (unless otherwise specified by Cornell Dubilier), and Cornell Dubilier assumes no obligation or liability for the advice given or results obtained. Although Cornell Dubilier strives to apply the most stringent quality and safety standards regarding the design and manufacturing of its products, in light of the current state of the art, isolated component failures may still occur. Accordingly, customer applications which require a high degree of reliability or safety should employ suitable designs or other safeguards (such as installation of protective circuitry or redundancies or other appropriate protective measures) in order to ensure that the failure of an electrical component does not result in a risk of personal injury or property damage. Although all product-related warnings, cautions and notes must be observed, the customer should not assume that all safety measures are indicated in such warnings, cautions and notes, or that other safety measures may not be required.

Type SN 85 ºC Non-Polar Aluminum Electrolytic Capacitors

85 ºC, Radial Leaded Non-Polar Aluminum Electrolytic

Type SN is a non-polar radial leaded aluminum electrolytic capacitor with a +85 ºC, 1000 hours life rating. The SN is ideal for applications where the polarity is unknown or reversed such as signal coupling circuits and speakers.

Highlights

- Non-polar
- +85 ºC
- Good for unknown polarity applications
- Available in T&R and ammo pack

Specifications

Capacitance Range: 0.47 to 2200 µF

Voltage Range: 6.3 to 100 WVNP

Capacitance Tolerance: ±20%

Operating Temperature Range: –40 ºC to +85 ºC

DC Leakage Current: After 2 minutes, +20 ºC at rated voltage

I = .03CV + 4 µA Max

C = Capacitance in (µF)

V = Rated voltage

I = Leakage current in µA

Dissipation Factor @ 120 Hz, +25 ºC:

WV (V)	6.3	10	16	25	35	50	100
DF(%)	24	20	17	15	14	12	10

For capacitance values > 1000 µF, the DF (%) value is increased 2% for every additional 1000 µF

Load Life: Apply WVNP for 1,000 hours at +85 ºC with polarity inverted every 250 hours

Capacitance change within 20% of initial limit

DC leakage current meets initial limits

ESR ≤ 200% of initial value

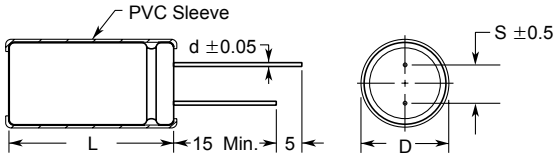
Shelf Life: 500 hrs with no voltage applied at +85 ºC

Cap change within 25% from initial limits

DC leakage ≤ 200% of initial value

ESR ≤ 200% of initial value

Outline Drawing



Case vented on diameters 6.3 and greater.

Vinyl sleeve adds .5 Max. to diameter and 2.0 Max. to length.

Dimensions in (millimeters)

Type SN 85 ºC Non-Polar Aluminum Electrolytic Capacitors

Part Numbering System

SN	100	M	100	S	T
Type	Capacitance (µF)	Capacitance Tolerance (%)	Rated Voltage (Vdc)	Packaging	Lead Configuration
SN	1R0 = 1	M = ±20	6R3 = 6.3	A = Tape & Ammo	1 = Lead cut
	100 = 10		010 = 10	E = Different Characteristic	2 = Lead form
	101 = 100		100 = 100	R = Tape & Reel	4 = Lead crimp & cut (form)
	102 = 1000			S = Standard	T = Standard

Ratings

Cap (µF)	Catalog Part Number	Max ESR 120 Hz +25 ºC (Ω)	Max Ripple 120 Hz +85 ºC (mA)	Size in. (mm) Diameter (D)	Length (L)	Lead Space (S)	Lead Dia. (d)
6.3 WVNP (8 VNP Surge)							
33	SN330M6R3ST	9.65	63	.197 (5.0)	.433 (11.0)	.079 (2.0)	.0197 (0.5)
47	SN470M6R3ST	6.78	84	.236 (6.0)	.433 (11.0)	.098 (2.5)	.0197 (0.5)
100	SN101M6R3ST	3.18	140	.315 (8.0)	.453 (11.5)	.138 (3.5)	.0197 (0.5)
220	SN221M6R3ST	1.45	235	.394 (10.0)	.472 (12.0)	.197 (5.0)	.0236 (0.6)
330	SN331M6R3ST	0.97	310	.394 (10.0)	.630 (16.0)	.197 (5.0)	.0236 (0.6)
470	SN471M6R3ST	0.68	400	.394 (10.0)	.787 (20.0)	.197 (5.0)	.0236 (0.6)
1000	SN102M6R3ST	0.32	690	.512 (13.0)	.984 (25.0)	.197 (5.0)	.0236 (0.6)
2200	SN222M6R3ST	0.16	1250	.630 (16.0)	1.26 (32.0)	.295 (7.5)	.0315 (0.8)
10 WVNP (13 VNP Surge)							
10	SN100M010ST	26.54	42	.197 (5.0)	.433 (11.0)	.079 (2.0)	.0197 (0.5)
22	SN220M010ST	12.06	57	.197 (5.0)	.433 (11.0)	.079 (2.0)	.0197 (0.5)
33	SN330M010ST	8.04	77	.236 (6.0)	.433 (11.0)	.098 (2.5)	.0197 (0.5)
47	SN470M010ST	5.65	93	.236 (6.0)	.433 (11.0)	.098 (2.5)	.0197 (0.5)
100	SN101M010ST	2.65	193	.315 (8.0)	.453 (11.5)	.138 (3.5)	.0197 (0.5)
220	SN221M010ST	1.21	255	.394 (10.0)	.630 (16.0)	.197 (5.0)	.0236 (0.6)
330	SN331M010ST	0.80	380	.394 (10.0)	.787 (20.0)	.197 (5.0)	.0236 (0.6)
470	SN471M010ST	0.56	470	.512 (13.0)	.787 (20.0)	.197 (5.0)	.0236 (0.6)
1000	SN102M010ST	0.27	885	.630 (16.0)	.984 (25.0)	.295 (7.5)	.0315 (0.8)
2200	SN222M010ST	0.13	1450	.630 (16.0)	1.42 (36.0)	.295 (7.5)	.0315 (0.8)
16 WVNP (20 VNP Surge)							
10	SN100M016ST	22.56	42	.236 (6.0)	.433 (11.0)	.079 (2.0)	.0197 (0.5)
22	SN220M016ST	10.25	69	.236 (6.0)	.433 (11.0)	.098 (2.5)	.0197 (0.5)
33	SN330M016ST	6.84	98	.315 (8.0)	.453 (11.5)	.138 (3.5)	.0197 (0.5)
47	SN470M016ST	4.80	115	.315 (8.0)	.453 (11.5)	.138 (3.5)	.0197 (0.5)
100	SN101M016ST	2.26	205	.394 (10.0)	.630 (16.0)	.197 (5.0)	.0236 (0.6)
220	SN221M016ST	1.03	330	.394 (10.0)	.787 (20.0)	.197 (5.0)	.0236 (0.6)
330	SN331M016ST	0.68	445	.512 (13.0)	.787 (20.0)	.197 (5.0)	.0236 (0.6)
470	SN471M016ST	0.48	570	.512 (13.0)	.984 (25.0)	.197 (5.0)	.0236 (0.6)
1000	SN102M016ST	0.23	1020	.630 (16.0)	1.26 (32.0)	.295 (7.5)	.0315 (0.8)

Ratings

Cap (µF)	Catalog Part Number	Max ESR 120 Hz +25 °C (Ω)	Max Ripple 120 Hz +85 °C (mA)	Size in. (mm) Diameter (D)	Length (L)	Lead Space (S)	Lead Dia. (d)
25 WVNP (32 VNP Surge)							
1.0	SN010M025ST	199.04	17	.197 (5.0)	.433 (11.0)	.079 (2.0)	.0197 (0.5)
2.2	SN2R2M025ST	90.47	25	.197 (5.0)	.433 (11.0)	.079 (2.0)	.0197 (0.5)
4.7	SN4R7M025ST	42.35	34	.197 (5.0)	.433 (11.0)	.079 (2.0)	.0197 (0.5)
10	SN100M025ST	19.90	50	.236 (6.0)	.433 (11.0)	.098 (2.5)	.0197 (0.5)
22	SN220M025ST	9.05	86	.315 (8.0)	.453 (11.5)	.138 (3.5)	.0197 (0.5)
33	SN330M025ST	6.03	105	.315 (8.0)	.453 (11.5)	.138 (3.5)	.0197 (0.5)
47	SN470M025ST	4.23	140	.394 (10.0)	.472 (12.0)	.197 (5.0)	.0236 (0.6)
100	SN101M025ST	1.99	240	.394 (10.0)	.787 (20.0)	.197 (5.0)	.0236 (0.6)
220	SN221M025ST	0.90	390	.512 (13.0)	.787 (20.0)	.197 (5.0)	.0236 (0.6)
330	SN331M025ST	0.60	580	.630 (16.0)	.984 (25.0)	.295 (7.5)	.0315 (0.8)
470	SN471M025ST	0.42	690	.630 (16.0)	.984 (25.0)	.295 (7.5)	.0315 (0.8)
35 WVNP (44 VNP Surge)							
3.3	SN3R3M035ST	56.30	27	.197 (5.0)	.433 (11.0)	.079 (2.0)	.0197 (0.5)
4.7	SN4R7M035ST	39.53	34	.197 (5.0)	.433 (11.0)	.079 (2.0)	.0197 (0.5)
10	SN100M035ST	18.58	54	.236 (6.0)	.433 (11.0)	.098 (2.5)	.0197 (0.5)
22	SN220M035ST	8.44	94	.315 (8.0)	.453 (11.5)	.138 (3.5)	.0197 (0.5)
33	SN330M035ST	5.63	125	.394 (10.0)	.472 (12.0)	.197 (5.0)	.0236 (0.6)
47	SN470M035ST	3.95	165	.394 (10.0)	.630 (16.0)	.197 (5.0)	.0236 (0.6)
100	SN101M035ST	1.86	285	.512 (13.0)	.787 (20.0)	.197 (5.0)	.0236 (0.6)
220	SN221M035ST	0.84	520	.630 (16.0)	.984 (25.0)	.197 (5.0)	.0236 (0.6)
330	SN331M035ST	0.56	630	.630 (16.0)	.984 (25.0)	.295 (7.5)	.0315 (0.8)
470	SN471M035ST	0.40	820	.630 (16.0)	1.26 (32.0)	.295 (7.5)	.0315 (0.8)
50 WVNP (63 VNP Surge)							
0.47	SNR47M050ST	338.80	11	.197 (5.0)	.433 (11.0)	.079 (2.0)	.0197 (0.5)
1.0	SN010M050ST	159.24	17	.197 (5.0)	.433 (11.0)	.079 (2.0)	.0197 (0.5)
2.2	SN2R2M050ST	72.38	25	.197 (5.0)	.433 (11.0)	.079 (2.0)	.0197 (0.5)
3.3	SN3R3M050ST	48.25	31	.236 (6.0)	.433 (11.0)	.098 (2.5)	.0197 (0.5)
4.7	SN4R7M050ST	33.88	41	.236 (6.0)	.433 (11.0)	.098 (2.5)	.0197 (0.5)
10	SN100M050ST	15.92	70	.315 (8.0)	.453 (11.5)	.138 (3.5)	.0197 (0.5)
22	SN220M050ST	7.24	115	.394 (10.0)	.472 (12.0)	.197 (5.0)	.0236 (0.6)
33	SN330M050ST	4.83	150	.394 (10.0)	.630 (16.0)	.197 (5.0)	.0236 (0.6)
47	SN470M050ST	3.39	190	.394 (10.0)	.787 (20.0)	.197 (5.0)	.0236 (0.6)
100	SN101M050ST	1.59	310	.512 (13.0)	.787 (20.0)	.197 (5.0)	.0236 (0.6)
220	SN221M050ST	0.72	570	.630 (16.0)	.984 (25.0)	.295 (7.5)	.0315 (0.8)
330	SN331M050ST	0.48	790	.630 (16.0)	1.42 (36.0)	.295 (7.5)	.0315 (0.8)
63 WVNP (79 VNP Surge)							
1.0	SN010M063ST	159.24	17	.197 (5.0)	.433 (11.0)	.079 (2.0)	.0197 (0.5)
2.2	SN2R2M063ST	72.38	25	.197 (5.0)	.433 (11.0)	.079 (2.0)	.0197 (0.5)
3.3	SN3R3M063ST	48.25	37	.197 (5.0)	.433 (11.0)	.098 (2.5)	.0197 (0.5)
4.7	SN4R7M063ST	33.88	44	.236 (6.0)	.433 (11.0)	.098 (2.5)	.0197 (0.5)
10.0	SN100M063ST	15.92	74	.315 (8.0)	.453 (11.5)	.138 (3.5)	.0197 (0.5)
22	SN220M063ST	7.24	130	.394 (10.0)	.630 (16.0)	.197 (5.0)	.0236 (0.6)
33	SN330M063ST	4.83	175	.394 (10.0)	.787 (20.0)	.197 (5.0)	.0236 (0.6)
47	SN470M063ST	3.39	230	.512 (13.0)	.787 (20.0)	.197 (5.0)	.0236 (0.6)
100	SN101M063ST	1.59	410	.630 (16.0)	.984 (25.0)	.295 (7.5)	.0315 (0.8)
220	SN221M063ST	0.72	660	.630 (16.0)	1.26 (32.0)	.295 (7.5)	.0315 (0.8)

Parts highlighted in yellow are obsolete.

Type SN 85 °C Non-Polar Aluminum Electrolytic Capacitors

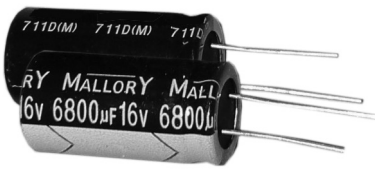
Ratings

Cap (µF)	Catalog Part Number	Max ESR 120 Hz +25 °C (Ω)	Max Ripple 120 Hz +85 °C (mA)	Size in. (mm) Diameter (D)	Length (L)	Lead Space (S)	Lead Dia. (d)
100 WVNP (125 VNP Surge)							
0.47	SNR47M100ST	282.33	14	.197 (5.0)	.433 (11.0)	.079 (2.0)	.0197 (0.5)
1.0	SN010M100ST	132.70	21	.197 (5.0)	.433 (11.0)	.098 (2.5)	.0197 (0.5)
2.2	SN2R2M100ST	60.32	34	.236 (6.0)	.433 (11.0)	.098 (2.5)	.0197 (0.5)
3.3	SN3R3M100ST	40.21	49	.315 (8.0)	.453 (11.5)	.138 (3.5)	.0197 (0.5)
4.7	SN4R7M100ST	28.23	58	.315 (8.0)	.453 (11.5)	.138 (3.5)	.0197 (0.5)
10.0	SN100M100ST	13.27	100	.394 (10.0)	.472 (12.0)	.197 (5.0)	.0236 (0.6)
22	SN220M100ST	6.03	180	.512 (13.0)	.787 (20.0)	.197 (5.0)	.0236 (0.6)
33	SN330M100ST	4.02	220	.512 (13.0)	.787 (20.0)	.197 (5.0)	.0236 (0.6)
47	SN470M100ST	2.82	285	.512 (13.0)	.984 (25.0)	.197 (5.0)	.0236 (0.6)
100	SN101M100ST	1.33	510	.630 (16.0)	1.26 (32.0)	.295 (7.5)	.0315 (0.8)

Parts highlighted in yellow are obsolete.

Type SS 85 ºC Sub-Miniature Aluminum Electrolytic Capacitors

Radial Leaded, General Purpose Aluminum Electrolytic



Type SS is a sub-miniature radial leaded aluminum electrolytic capacitor with a +85 ºC, 1000 hour long life rating. The SS has a small size and is ideal for high density packaging applications.

Highlights

- Sub-miniature
- +85 ºC
- Great for high density packaging
- Available in T&R and ammo pack

Specifications

Capacitance Range: 0.1 to 100 µF

Voltage Range: 6.3 to 63 Vdc

Capacitance Tolerance: ±20%

Operating Temperature Range: –40 ºC to +85 ºC

DC Leakage Current: After 2 minutes, +25 ºC at rated voltage

I = .01CV or 3 µA Max, whichever is greater

C = Capacitance in (µF)

V = Rated voltage

I = Leakage current in µA

Ripple Multipliers for Voltage and Temperature:

Rated WVdc	Ripple Multipliers		
	60 Hz	120 Hz	1 kHz
6 to 25	0.85	1.0	1.10
35 to 63	0.80	1.0	1.15

Ambient Temperature	Ripple Multiplier
+85 ºC	1.00
+75 ºC	1.14
+65 ºC	1.25

Dissipation Factor @ 120 Hz, +20 ºC:

WVdc	6.3	10	16	25	35	50	63
DF (%)	24	20	16	14	12	10	10

For capacitors whose capacitance values exceed 1000 µF, the value of DF (%) is increased 2% for every additional 1000 µF

Load Life Test: Apply WVdc for 1,000 hours at +85 ºC

Capacitance change within 20% of initial limit

DC leakage current meets initial limits

ESR ≤ 200% of initial value

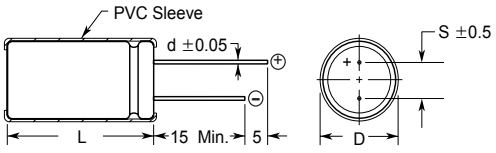
Shelf Life: 1000 hrs with no voltage applied

Cap change within 20% of initial values

DC leakage meets initial requirement

DF 200%, meets initial requirement

Outline Drawing



Case vented on diameters 6.3 and greater.

Vinyl sleeve adds .5 Max. to diameter and 2.0 Max. to length.

Dimensions in (millimeters)

Type SS 85 ºC Sub-Miniature Aluminum Electrolytic Capacitors

Part Numbering System

SS	100	M	63	S	T
Type	Capacitance (µF)	Capacitance Tolerance (%)	Rated Voltage (Vdc)	Packaging	Lead Configuration
SS	1R0 = 1 100 = 10 101 = 100 102 = 1000	M = ±20	6R3 = 6.3 063 = 63	A = Tape & Ammo E = Different Characteristic R = Tape & Reel S = Standard	1 = Lead cut 2 = Lead form 4 = Lead crimp & cut (form) T = Standard

Ratings

Cap (µF)	Catalog Part Number	Max ESR 120 Hz +25 ºC (Ω)	Max Ripple 120 Hz +85 ºC (mA)	Size in. (mm) Diameter (D)	Length (L)	Lead Space (S)	Lead Dia. (d)
6.3 Vdc (8 Volts Surge)							
22	SS220M6R3ST	14.48	34	.157 (4.0)	.276 (7.0)	.059 (1.5)	.0180 (0.45)
33	SS330M6R3ST	9.65	42	.197 (5.0)	.276 (7.0)	.079 (2.0)	.0197 (0.50)
47	SS470M6R3ST	6.78	50	.197 (5.0)	.276 (7.0)	.079 (2.0)	.0197 (0.50)
100	SS101M6R3ST	3.18	77	.248 (6.3)	.276 (7.0)	.098 (2.5)	.0197 (0.50)
10 Vdc (13 Volts Surge)							
22	SS220M010ST	12.06	38	.197 (5.0)	.276 (7.0)	.079 (2.0)	.0197 (0.50)
33	SS330M010ST	8.04	47	.197 (5.0)	.276 (7.0)	.079 (2.0)	.0197 (0.50)
47	SS470M010ST	5.65	59	.248 (6.3)	.276 (7.0)	.098 (2.5)	.0197 (0.50)
100	SS101M010ST	2.65	80	.248 (6.3)	.276 (7.0)	.098 (2.5)	.0197 (0.50)
16 Vdc (20 Volts Surge)							
10	SS100M016ST	22.56	29	.157 (4.0)	.276 (7.0)	.059 (1.5)	.0180 (0.45)
22	SS220M016ST	10.25	44	.197 (5.0)	.276 (7.0)	.079 (2.0)	.0197 (0.50)
33	SS330M016ST	6.84	57	.197 (5.0)	.276 (7.0)	.079 (2.0)	.0197 (0.50)
47	SS470M016ST	4.80	68	.248 (6.3)	.276 (7.0)	.098 (2.5)	.0197 (0.50)
25 Vdc (32 Volts Surge)							
4.7	SS4R7M025ST	42.35	24	.157 (4.0)	.276 (7.0)	.059 (1.5)	.0180 (0.45)
10	SS100M025ST	19.9	33	.197 (5.0)	.276 (7.0)	.079 (2.0)	.0197 (0.50)
22	SS220M025ST	9.05	51	.236 (6.0)	.276 (7.0)	.098 (2.5)	.0197 (0.50)
33	SS330M025ST	6.03	63	.236 (6.0)	.276 (7.0)	.098 (2.5)	.0197 (0.50)
47	SS470M025ST	4.23	71	.248 (6.3)	.276 (7.0)	.098 (2.5)	.0197 (0.50)

Ratings

Cap (µF)	Catalog Part Number	Max ESR 120 Hz +25 ºC (Ω)	Max Ripple 120 Hz +85 ºC (mA)	Size in. (mm) Diameter (D)	Length (L)	Lead Space (S)	Lead Dia. (d)
35 Vdc (44 Volts Surge)							
4.7	SS4R7M035ST	33.88	24	.157 (4.0)	.276 (7.0)	.059 (1.5)	.0180 (0.45)
10	SS100M035ST	15.92	36	.197 (5.0)	.276 (7.0)	.079 (2.0)	.0197 (0.50)
22	SS220M035ST	7.24	57	.248 (6.3)	.276 (7.0)	.098 (2.5)	.0197 (0.50)
50 Vdc (63 Volts Surge)							
0.10	SSR10M050ST	1326.96	1	.157 (4.0)	.276 (7.0)	.059 (1.5)	.0180 (0.45)
0.22	SSR22M050ST	603.17	2	.157 (4.0)	.276 (7.0)	.059 (1.5)	.0180 (0.45)
0.33	SSR33M050ST	402.11	3	.157 (4.0)	.276 (7.0)	.059 (1.5)	.0180 (0.45)
0.47	SSR47M050ST	282.33	5	.157 (4.0)	.276 (7.0)	.059 (1.5)	.0180 (0.45)
1.0	SS010M050ST	132.70	10	.157 (4.0)	.276 (7.0)	.059 (1.5)	.0180 (0.45)
2.2	SS2R2M050ST	60.32	19	.157 (4.0)	.276 (7.0)	.059 (1.5)	.0180 (0.45)
3.3	SS3R3M050ST	40.21	24	.157 (4.0)	.276 (7.0)	.059 (1.5)	.0180 (0.45)
4.7	SS4R7M050ST	28.23	29	.157 (4.0)	.276 (7.0)	.079 (2.0)	.0180 (0.45)
10.0	SS100M050ST	13.27	44	.197 (5.0)	.276 (7.0)	.079 (2.0)	.0197 (0.50)
63 Vdc (79 Volts Surge)							
0.10	SSR10M063ST	1061.57	1	.157 (4.0)	.276 (7.0)	.059 (1.5)	.0180 (0.45)
0.22	SSR22M063ST	482.53	2	.157 (4.0)	.276 (7.0)	.059 (1.5)	.0180 (0.45)
0.33	SSR33M063ST	321.69	4	.157 (4.0)	.276 (7.0)	.059 (1.5)	.0180 (0.45)
0.47	SSR47M063ST	225.87	6	.157 (4.0)	.276 (7.0)	.059 (1.5)	.0180 (0.45)
1.0	SS010M063ST	106.16	13	.157 (4.0)	.276 (7.0)	.059 (1.5)	.0180 (0.45)
2.2	SS2R2M063ST	48.25	21	.157 (4.0)	.276 (7.0)	.059 (1.5)	.0180 (0.45)
3.3	SS3R3M063ST	32.17	26	.157 (4.0)	.276 (7.0)	.059 (1.5)	.0180 (0.45)
4.7	SS4R7M063ST	22.59	33	.248 (6.3)	.276 (7.0)	.098 (2.5)	.0197 (0.50)

Parts highlighted in yellow are obsolete

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Type SXR 105 °C Long Life Aluminum Electrolytic Capacitors

Low ESR, High Ripple, Radial Leaded Aluminum Electrolytic Capacitors

Type SXR is a radial leaded aluminum electrolytic capacitor with a +105 °C, 2000 to 5000 hours long life ratings. The low ESR and high ripple current ratings make it ideal for output filtering applications in switching power supplies.

Highlights

- +105 °C
- 2000 to 5000 hours - long life
- Low ESR
- High ripple current
- Available in T & R and ammo pack

Specifications

Temperature Range

–40 °C to +105 °C

Rated Voltage Range

6.3 to 100 Vdc

Capacitance Range

22 to 15,000 µF

Capacitance Tolerance

± 20%

DC Leakage Current

I ≤ .01CV or 3 µA after 2 minutes @ +20 °C, whichever is greater
C = Capacitance in (µF)
V = Rated voltage
I = Leakage current in µA

Ripple Current Multipliers

Rated WVDC	Ripple Multipliers					
	60Hz	120Hz	400 Hz	1 kHz	10 kHz	100 kHz
10 - 16	0.45	0.60	0.83	0.94	0.98	1.00
25 - 35	0.38	0.50	0.75	0.90	0.97	1.00
50 - 100	0.36	0.46	0.70	0.88	0.94	1.00

Temperature (°C)	+65	+75	+85	+95	+105
Multiplier	2.12	1.92	1.69	1.50	1.00

Dissipation Factor @ 120 Hz, +25 °C

WV (V)	6.3	10	16	25	35	50	63	100
DF(%)	22	19	16	14	12	10	9	8

For capacitors whose capacitance value exceeds 1000 µF, the value of DF (%) is increased 2% for every additional 1000 µF

Load Life Test

Apply WVDC for:

Case Dia.	Lifetime (Hours)
≤ 6.3 mm	2000
8.0 mm	3000
10.0 mm	4000
≥13.0 mm	5000

Capacitance change within 25% of initial value
DC leakage current meets initial limits
DF ≤ 200% of initial limit

Shelf Life

1000 hrs with no voltage applied at +105 °C
Cap change within 25% of initial values
DF ≤ 200% of initial limit
DC leakage current meets initial limits

RoHS Compliant

CDE Cornell Dubilier • 1605 E. Rodney French Blvd. • New Bedford, MA 02744 • Phone: (508)996-8561 • Fax: (508)996-3830

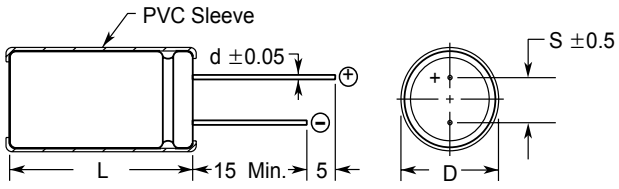
Type SXR 105 °C Long Life Aluminum Electrolytic Capacitors

Low ESR, High Ripple, Radial Leaded Aluminum Electrolytic Capacitors

Part Numbering System

SXR	101	M	100	S	T
Type	Capacitance	Capacitance Tolerance	Rated Voltage	Packaging	Lead Configuration
SXR	(µF)	(%)	(Vdc)	A = Tape & Ammo	1 = Lead cut
	1R0 = 1	K = ±10	6R3 = 6.3	E = Different Characteristic	2 = Lead form
	100 = 10	M = ±20	010 = 10	R = Tape & Reel	4 = Lead crimp & cut (form)
	101 = 100		100 = 100	S = Standard	
	102 = 1000				

Outline Drawing



Case vented on diameters 6.3 and greater

Vinyl sleeve adds .5 Max. to diameter and 2.0 Max. to length

Outline Dimensions (Millimeters)

Ratings

Cap (µF)	Catalog Part Number	Max ESR 100 kHz 25 °C (Ω)	Max Ripple 100 kHz 105 °C (mA)	Size in. (mm) Diameter (D)	Length (L)	Lead Space (S)	Lead Dia. (d)
6.3 Vdc (8 Volts Surge)							
120	SXR121M6R3ST	2.43	154	.197 (5.0)	.433 (11.0)	.079 (2.0)	.0197 (0.5)
150	SXR151M6R3ST	1.95	210	.236 (6.0)	.433 (11.0)	.098 (2.5)	.0197 (0.5)
220	SXR221M6R3ST	1.33	260	.315 (8.0)	.433 (11.0)	.138 (3.5)	.0236 (0.6)
330	SXR331M6R3ST	0.88	350	.315 (8.0)	.433 (11.0)	.138 (3.5)	.0236 (0.6)
470	SXR471M6R3ST	0.62	510	.394 (10.0)	.472 (12.0)	.197 (5.0)	.0236 (0.6)
680	SXR681M6R3ST	0.43	635	.394 (10.0)	.630 (16.0)	.197 (5.0)	.0236 (0.6)
820	SXR821M6R3ST	0.36	650	.394 (10.0)	.630 (16.0)	.197 (5.0)	.0236 (0.6)
1000	SXR102M6R3ST	0.29	860	.394 (10.0)	.787 (20.0)	.197 (5.0)	.0236 (0.6)
1200	SXR122M6R3ST	0.24	860	.394 (10.0)	.787 (20.0)	.197 (5.0)	.0236 (0.6)
1500	SXR152M6R3ST	0.20	1030	.394 (10.0)	.984 (25.0)	.197 (5.0)	.0236 (0.6)
3300	SXR332M6R3ST	0.10	1280	.472 (12.0)	1.38 (35.0)	.197 (5.0)	.0236 (0.6)
4700	SXR472M6R3ST	0.08	1770	.472 (12.0)	1.38 (35.0)	.197 (5.0)	.0236 (0.6)
6800	SXR682M6R3ST	0.07	1810	.630 (16.0)	1.26 (32.0)	.295 (7.5)	.0315 (0.8)
8200	SXR822M6R3ST	0.06	2030	.630 (16.0)	1.40 (36.0)	.295 (7.5)	.0315 (0.8)
10000	SXR103M6R3ST	0.05	2320	.630 (16.0)	1.57 (40.0)	.295 (7.5)	.0315 (0.8)
15000	SXR153M6R3ST	0.04	2460	.709 (18.0)	1.57 (40.0)	.295 (7.5)	.0315 (0.8)

Type SXR 105 °C Long Life Aluminum Electrolytic Capacitors

Low ESR, High Ripple, Radial Leaded Aluminum Electrolytic Capacitors

Cap (µF)	Catalog Part Number	Max ESR 100 kHz 25 °C (Ω)	Max Ripple 100 kHz 105 °C (mA)	Size in. (mm) Diameter (D)	Length (L)	Lead Space (S)	Lead Dia. (d)
10 Vdc (13 Volts Surge)							
100	SXR101M010ST	2.52	180	.236 (6.0)	.433 (11.0)	.098 (2.5)	.0197 (0.5)
120	SXR121M010ST	2.10	210	.236 (6.0)	.433 (11.0)	.098 (2.5)	.0197 (0.5)
150	SXR151M010ST	1.68	240	.236 (6.0)	.433 (11.0)	.098 (2.5)	.0197 (0.5)
220	SXR221M010ST	1.15	300	.315 (8.0)	.433 (11.0)	.138 (3.5)	.0236 (0.6)
330	SXR331M010ST	0.76	400	.315 (8.0)	.472 (12.0)	.138 (3.5)	.0236 (0.6)
470	SXR471M010ST	0.54	500	.394 (10.0)	.472 (12.0)	.197 (5.0)	.0236 (0.6)
680	SXR681M010ST	0.37	650	.394 (10.0)	.630 (16.0)	.197 (5.0)	.0236 (0.6)
820	SXR821M010ST	0.31	860	.394 (10.0)	.787 (20.0)	.197 (5.0)	.0236 (0.6)
1000	SXR102M010ST	0.25	970	.394 (10.0)	.787 (20.0)	.197 (5.0)	.0236 (0.6)
1200	SXR122M010ST	0.21	1030	.394 (10.0)	.984 (25.0)	.197 (5.0)	.0236 (0.6)
1500	SXR152M010ST	0.18	1150	.394 (10.0)	1.18 (30.0)	.197 (5.0)	.0236 (0.6)
2200	SXR222M010ST	0.13	1320	.472 (12.0)	1.18 (30.0)	.197 (5.0)	.0236 (0.6)
3300	SXR332M010ST	0.09	1770	.512 (13.0)	1.42 (36.0)	.197 (5.0)	.0236 (0.6)
4700	SXR472M010ST	0.08	1810	.630 (16.0)	1.26 (32.0)	.295 (7.5)	.0315 (0.8)
6800	SXR682M010ST	0.06	2030	.630 (16.0)	1.42 (36.0)	.295 (7.5)	.0315 (0.8)
10000	SXR103M010ST	0.05	2460	.709 (18.0)	1.57 (40.0)	.295 (7.5)	.0315 (0.8)
16 Vdc (20 Volts Surge)							
100	SXR101M016ST	2.12	230	.315 (8.0)	.630 (16.0)	.138 (3.5)	.0197 (0.5)
120	SXR121M016ST	1.77	260	.315 (8.0)	.433 (11.0)	.138 (3.5)	.0236 (0.6)
150	SXR151M016ST	1.42	300	.315 (8.0)	.433 (11.0)	.138 (3.5)	.0236 (0.6)
220	SXR221M016ST	0.97	400	.315 (8.0)	.433 (11.0)	.138 (3.5)	.0236 (0.6)
330	SXR331M016ST	0.64	500	.394 (10.0)	.472 (12.0)	.197 (5.0)	.0236 (0.6)
470	SXR471M016ST	0.45	650	.394 (10.0)	.630 (16.0)	.197 (5.0)	.0236 (0.6)
680	SXR681M016ST	0.31	860	.394 (10.0)	.787 (20.0)	.197 (5.0)	.0236 (0.6)
820	SXR821M016ST	0.26	1030	.394 (10.0)	.984 (25.0)	.197 (5.0)	.0236 (0.6)
1000	SXR102M016ST	0.21	1150	.394 (10.0)	1.18 (30.0)	.197 (5.0)	.0236 (0.6)
1200	SXR122M016ST	0.18	1120	.472 (12.0)	.984 (25.0)	.197 (5.0)	.0236 (0.6)
1500	SXR152M016ST	0.15	1320	.472 (12.0)	.984 (25.0)	.197 (5.0)	.0236 (0.6)
2200	SXR222M016ST	0.11	1540	.472 (12.0)	1.18 (30.0)	.197 (5.0)	.0236 (0.6)
3300	SXR332M016ST	0.08	1980	.472 (12.0)	1.57 (40.0)	.197 (5.0)	.0236 (0.6)
4700	SXR472M016ST	0.07	2030	.630 (16.0)	1.42 (36.0)	.295 (7.5)	.0315 (0.8)
6800	SXR682M016ST	0.05	2240	.709 (18.0)	1.42 (36.0)	.295 (7.5)	.0315 (0.8)
8200	SXR822M016ST	0.05	2460	.709 (18.0)	1.57 (40.0)	.295 (7.5)	.0315 (0.8)
25 Vdc (32 Volts Surge)							
100	SXR101M025ST	1.86	300	.315 (8.0)	.630 (16.0)	.138 (3.5)	.0197 (0.5)
120	SXR121M025ST	1.55	350	.315 (8.0)	.433 (11.0)	.138 (3.5)	.0236 (0.6)
150	SXR151M025ST	1.24	400	.394 (10.0)	.472 (12.0)	.197 (5.0)	.0236 (0.6)
220	SXR221M025ST	0.84	500	.394 (10.0)	.472 (12.0)	.197 (5.0)	.0236 (0.6)
330	SXR331M025ST	0.56	650	.394 (10.0)	.630 (16.0)	.197 (5.0)	.0236 (0.6)
470	SXR471M025ST	0.40	860	.394 (10.0)	.787 (20.0)	.197 (5.0)	.0236 (0.6)
680	SXR681M025ST	0.27	1150	.394 (10.0)	1.18 (30.0)	.197 (5.0)	.0236 (0.6)
820	SXR821M025ST	0.23	1120	.472 (12.0)	.984 (25.0)	.197 (5.0)	.0236 (0.6)
1000	SXR102M025ST	0.19	1320	.472 (12.0)	.984 (25.0)	.197 (5.0)	.0236 (0.6)
1200	SXR122M025ST	0.15	1400	.472 (12.0)	1.18 (30.0)	.197 (5.0)	.0236 (0.6)
1500	SXR152M025ST	0.13	1540	.472 (12.0)	1.18 (30.0)	.197 (5.0)	.0236 (0.6)
2200	SXR222M025ST	0.10	1980	.472 (12.0)	1.57 (40.0)	.197 (5.0)	.0236 (0.6)
3300	SXR332M025ST	0.07	2030	.630 (16.0)	1.42 (36.0)	.295 (7.5)	.0315 (0.8)
4700	SXR472M025ST	0.06	2460	.709 (18.0)	1.57 (40.0)	.295 (7.5)	.0315 (0.8)

Type SXR 105 ºC Long Life Aluminum Electrolytic Capacitors

Low ESR, High Ripple, Radial Leaded Aluminum Electrolytic Capacitors

Cap (µF)	Catalog Part Number	Max ESR 100 kHz 25 ºC (Ω)	Max Ripple 100 kHz 105 ºC (mA)	Size in. (mm) Diameter (D)	Length (L)	Lead Space (S)	Lead Dia. (d)
35 Vdc (44 Volts Surge)							
100	SXR101M035ST	1.59	400	.394 (10.0)	.472 (12.0)	.197 (5.0)	.0236 (0.6)
120	SXR121M035ST	1.33	510	.394 (10.0)	.472 (12.0)	.197 (5.0)	.0236 (0.6)
150	SXR151M035ST	1.06	550	.394 (10.0)	.472 (12.0)	.197 (5.0)	.0236 (0.6)
220	SXR221M035ST	0.72	650	.394 (10.0)	.630 (16.0)	.197 (5.0)	.0236 (0.6)
330	SXR331M035ST	0.48	860	.394 (10.0)	.787 (20.0)	.197 (5.0)	.0236 (0.6)
470	SXR471M035ST	0.34	1150	.394 (10.0)	1.18 (30.0)	.197 (5.0)	.0236 (0.6)
680	SXR681M035ST	0.23	1320	.472 (12.0)	.984 (25.0)	.197 (5.0)	.0236 (0.6)
820	SXR821M035ST	0.19	1400	.472 (12.0)	1.18 (30.0)	.197 (5.0)	.0236 (0.6)
1000	SXR102M035ST	0.16	1540	.472 (12.0)	1.18 (30.0)	.197 (5.0)	.0236 (0.6)
1200	SXR122M035ST	0.13	1770	.472 (12.0)	1.38 (35.0)	.197 (5.0)	.0236 (0.6)
1500	SXR152M035ST	0.12	1980	.472 (12.0)	1.57 (40.0)	.197 (5.0)	.0236 (0.6)
2200	SXR222M035ST	0.08	2030	.630 (16.0)	1.40 (36.0)	.295 (7.5)	.0315 (0.8)
3300	SXR332M035ST	0.47	2460	.709 (18.0)	1.57 (40.0)	.295 (7.5)	.0315 (0.8)
50 Vdc (63 Volts Surge)							
68	SXR680M050ST	1.95	400	.394 (10.0)	.472 (12.0)	.197 (5.0)	.0236 (0.6)
100	SXR101M050ST	1.33	635	.394 (10.0)	.630 (16.0)	.197 (5.0)	.0236 (0.6)
120	SXR121M050ST	1.11	650	.394 (10.0)	.630 (16.0)	.197 (5.0)	.0236 (0.6)
150	SXR151M050ST	0.88	860	.394 (10.0)	.787 (20.0)	.197 (5.0)	.0236 (0.6)
220	SXR221M050ST	0.60	1030	.394 (10.0)	.984 (25.0)	.197 (5.0)	.0236 (0.6)
330	SXR331M050ST	0.40	1150	.394 (10.0)	1.18 (30.0)	.197 (5.0)	.0236 (0.6)
470	SXR471M050ST	0.28	1320	.472(12.0)	.984 (25.0)	.197 (5.0)	.0236 (0.6)
680	SXR681M050ST	0.20	1770	.472 (12.0)	1.38 (35.0)	.197 (5.0)	.0236 (0.6)
820	SXR821M050ST	0.16	1980	.472 (12.0)	1.57 (40.0)	.197 (5.0)	.0236 (0.6)
1000	SXR102M050ST	0.13	1810	.630 (16.0)	1.26 (32.0)	.295 (7.5)	.0315 (0.8)
1200	SXR122M050ST	0.11	2030	.630 (16.0)	1.40 (36.0)	.295 (7.5)	.0315 (0.8)
1500	SXR152M050ST	0.10	2320	.630 (16.0)	1.57 (40.0)	.295 (7.5)	.0315 (0.8)
63 Vdc (79 Volts Surge)							
47	SXR470M063ST	2.26	305	.394 (10.0)	.472 (12.0)	.197 (5.0)	.0236 (0.6)
68	SXR680M063ST	1.56	500	.394 (10.0)	.630 (16.0)	.197 (5.0)	.0236 (0.6)
100	SXR101M063ST	1.06	550	.394 (10.0)	.630 (16.0)	.197 (5.0)	.0236 (0.6)
120	SXR121M063ST	0.88	620	.394 (10.0)	.787 (20.0)	.197 (5.0)	.0236 (0.6)
150	SXR151M063ST	0.71	795	.394 (10.0)	.984 (25.0)	.197 (5.0)	.0236 (0.6)
220	SXR221M063ST	0.48	890	.472 (12.0)	.984 (25.0)	.197 (5.0)	.0236 (0.6)
330	SXR331M063ST	0.32	1320	.472 (12.0)	1.18 (30.0)	.197 (5.0)	.0236 (0.6)
470	SXR471M063ST	0.23	1450	.472 (12.0)	1.38 (35.0)	.197 (5.0)	.0236 (0.6)
680	SXR681M063ST	0.16	1790	.630 (16.0)	1.26 (32.0)	.295 (7.5)	.0315 (0.8)
1000	SXR102M063ST	0.11	2200	.709 (18.0)	1.40 (36.0)	.295 (7.5)	.0315 (0.8)
1200	SXR122M063ST	0.09	2370	.709 (18.0)	1.57 (40.0)	.295 (7.5)	.0315 (0.8)
100 Vdc (125 Volts Surge)							
22	SXR220M100ST	4.22	305	.394 (10.0)	.472 (12.0)	.197 (5.0)	.0236 (0.6)
33	SXR330M100ST	2.81	500	.394 (10.0)	.630 (16.0)	.197 (5.0)	.0236 (0.6)
47	SXR470M100ST	1.98	600	.394 (10.0)	.787 (20.0)	.197 (5.0)	.0236 (0.6)
68	SXR680M100ST	1.37	795	.394 (10.0)	.984 (25.0)	.197 (5.0)	.0236 (0.6)
100	SXR101M100ST	0.93	905	.394 (10.0)	1.18 (30.0)	.197 (5.0)	.0236 (0.6)
120	SXR121M100ST	0.77	1040	.472 (12.0)	1.18 (30.0)	.197 (5.0)	.0236 (0.6)
150	SXR151M100ST	0.62	1200	.472 (12.0)	1.18 (30.0)	.197 (5.0)	.0236 (0.6)
220	SXR221M100ST	0.42	1440	.630 (16.0)	1.26 (32.0)	.295 (7.5)	.0315 (0.8)
330	SXR331M100ST	0.28	1790	.709 (18.0)	1.40 (36.0)	.295 (7.5)	.0315 (0.8)

Type SXR 105 °C Long Life Aluminum Electrolytic Capacitors

Low ESR, High Ripple, Radial Leaded Aluminum Electrolytic Capacitors

Taping & Packaging

Fig. 1 - Formed Taping

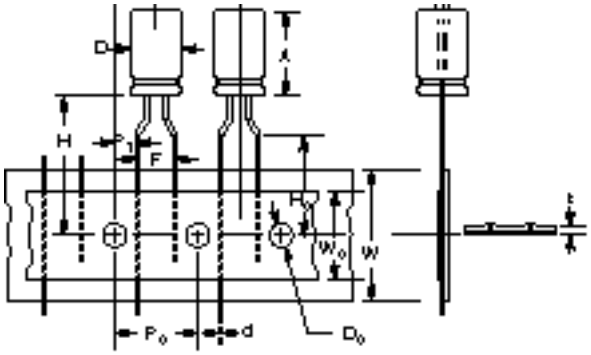


Fig. 2 - Straight Taping (5Φ, 6.3Φ, 8Φ)

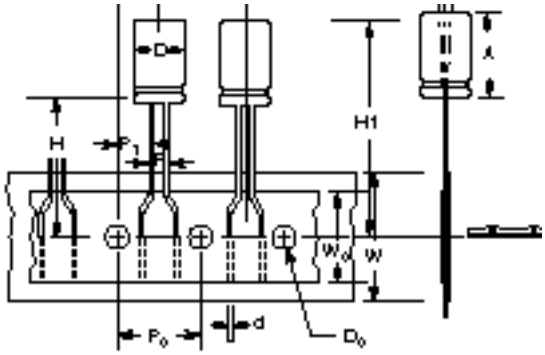


Fig. 3- Straight Taping (Under 10Φ, 12Φ, 13Φ)

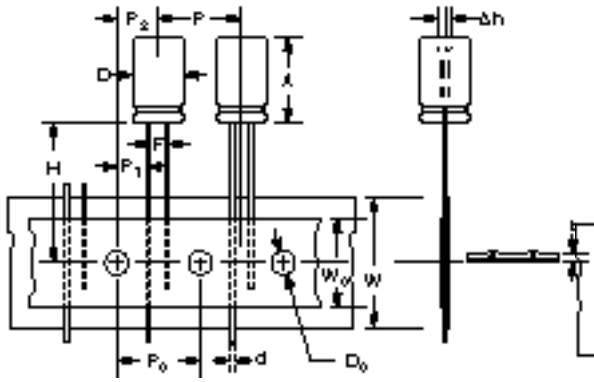
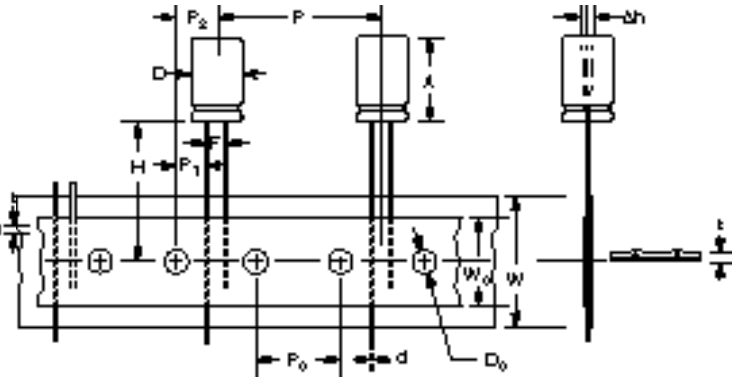


Fig. 4- Straight Taping (16Φ, 18Φ)

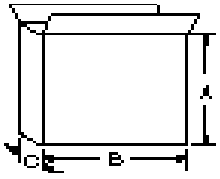


Standard Lead Spacing of Taped Components is 5mm
Other Lead Spacing is Available by Special Order

Code	D	A	d	P	P_0	P_1	P_2	F	W	W_0	H	H_0	D_0	t	ih	Fig.
Tolerance	0.5	1.0	±0.05	±1.0	±0.2	±0.7	±1.3	+0.8 -0.2	±0.5	Min.	±0.75	±0.5	±0.2	±0.2	Max.	
Item	4 ~ 6.3	7.0	0.45	12.7	12.7	3.85	6.35	5.0	18.0	12.5	18.5	16.0	4.0	0.7	2.0	1
	5 ~ 8	12.5	0.5	12.7	12.7	3.85	6.35	5.0	18.0	12.5	18.5	16.0	4.0	0.7	2.0	
	5, 6.3	12.5	0.5	12.7	12.7	5.1	6.35	2.5	18.0	12.5	18.5	——	4.0	0.7	2.0	2
	8	12.5	0.5	12.7	12.7	4.6	6.35	3.5	18.0	12.5	18.5	——	4.0	0.7	2.0	
	10	21.0	0.6	12.7	12.7	3.85	6.35	5.0	18.0	12.5	18.5	——	4.0	0.7	2.0	3
	12, 13	26.0	0.6	15.0	15.0	5.0	7.5	5.0	18.0	12.5	18.5	——	4.0	0.7	2.0	
	16, 18	26.0	0.8	30.0	15.0	3.75	7.5	7.5	18.0	12.5	18.0	——	4.0	0.7	2.0	4

Capacitor Diameter D (mm)	Ammo Pack Box Dimensions (mm)			Quantity Per Ammo Pack Box
	A±5	B Max	C±3	
4	250	340	54	3000
5	250	340	54	2,000
6.3	290	340	54	2,000
8	250	340	54	1,000
10 (12 L)	290	340	54	600
10 (16 L)	350	340	59	600
10 (20 L)	340	340	71	600
12, 13	340	340	71	400
16	340	340	71	300

Ammo Pack



Ammo Pack boxes are shipped 5 to the outer packing carton

Tape And Reel Quantities

Case Diameter D (mm)	Reel Width	Reel Qty. (Pcs.)
4	44	1500
5	44	1200
6	44	1000
8	44	800
10 (12L)	44	600
10 (16L)	50	600
12, 13	-	-
16	-	-

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