

SINGLE-ENDED LEADS - Very low Impedance 105°C / 1000 to 5000 h

Description

Very low Impedance and high-ripple current.

Applications

High frequency switching mode circuits.

Features

Case with $\varnothing D \geq 6.0$ mm has the safety vent at the bottom.

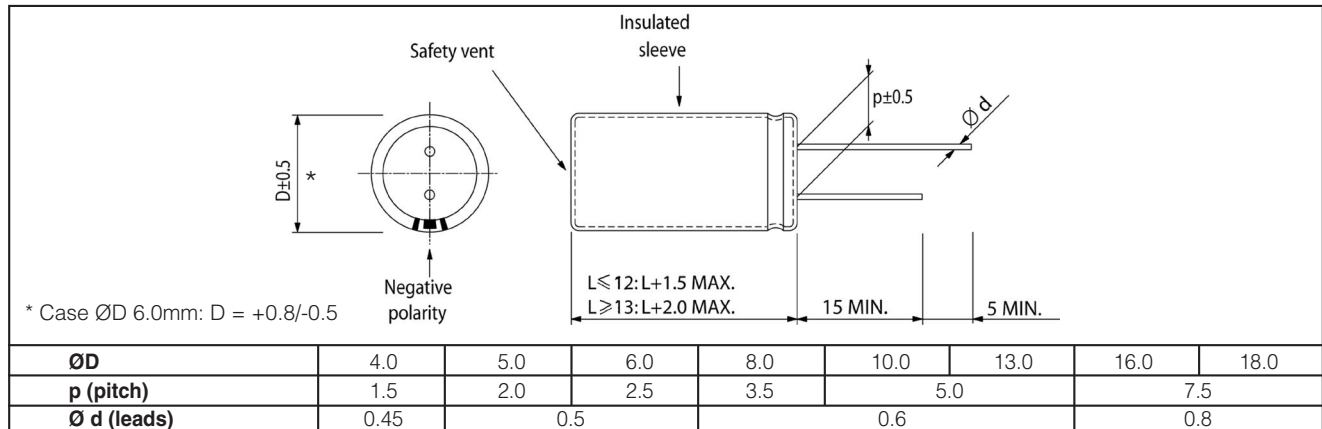
Marking

Series: (ESY), Operating temperature: (105°C)

Rated capacitance (μF), Rated voltage: (Vdc),

Negative polarity: (gold line), Date code

Diagram of dimensions (Units=mm)



Electrical characteristics

Rated voltage	6.3 to 100 Vdc
Operating temperature	-40 to +105°C
Capacitance range	5.6 μF to 6800 μF
Capacitance tolerance	$\pm 20\%$ at 120Hz / 20°C
Endurance test	1000 to 5000 h (see conditions in Test method and performance)
Leakage current	$I = 0.01 CV (\mu A)$ or $3\mu A$ whichever is greater C = rated capacitance (μF); V = rated voltage (Vdc) (after than D.C. rated working voltage at 20°C has been applied for 2 min)

Impedance Z characteristics at 120 Hz

Rated voltage (Vdc)	6.3	10	16	25	35	50	63	100
Z (-40°C) / Z (20°C)	3	3	3	3	3	3	3	3
Z (-25°C) / Z (20°C)	2	2	2	2	2	2	2	2

Compensation factor of ripple current (R.C.) vs. frequency

Capacitance range	50 Hz	120 Hz	1 kHz	10 kHz	100 kHz
5.6 to 390 μF	0.60	0.70	0.85	0.95	1.00
470 to 1000 μF	0.65	0.75	0.90	0.98	1.00
1200 to 6800 μF	0.75	0.80	0.95	1.00	1.00

Compensation factor of ripple current (R.C.) vs. temperature

Temperature	65°C	85°C	105°C
Multiplier factors	2.0	1.50	1.00

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Test method and performance

Conditions	Load life test	Shelf life test															
Temperature: Test duration:	105°C <table><tr><th colspan="2">Case (mm)</th><th>Hours</th></tr><tr><td>L = 7</td><td>ØD ≤8.0</td><td>1000</td></tr><tr><td rowspan="4">L ≥11</td><td>ØD ≤6.0</td><td>2000</td></tr><tr><td>ØD = 8.0</td><td>3000</td></tr><tr><td>ØD = 10.0</td><td>4000</td></tr><tr><td>ØD ≥13.0</td><td>5000</td></tr></table>	Case (mm)		Hours	L = 7	ØD ≤8.0	1000	L ≥11	ØD ≤6.0	2000	ØD = 8.0	3000	ØD = 10.0	4000	ØD ≥13.0	5000	105°C 1000 hours
Case (mm)		Hours															
L = 7	ØD ≤8.0	1000															
L ≥11	ØD ≤6.0	2000															
	ØD = 8.0	3000															
	ØD = 10.0	4000															
	ØD ≥13.0	5000															
Ripple current: Voltage:	max ripple current at 100KHz 105°C specified in table. the sum of D.C. voltage and the peak A.C. voltage must not exceed the rated voltage of capacitor.	no ripple current applied. no voltage applied.															
Performance	The following specifications will be satisfied when the capacitors are restored at 20°C.																
Capacitance change: Dissipation factor: Leakage current:	within 25% of initial value. not exceed 200% of the initial requirement. not exceed initial requirement.	within 25% of initial value. not exceed 200% of the initial requirement. not exceed initial requirement.															

Technical data and ordering codes

6.3 Vdc Rated voltage - 8 Vdc Surge voltage						
Rated cap. 120 Hz 20°C (µF)	Case size DxL (mm)	D.F. 120 Hz 25°C (tgδ %)	Z 100 kHz 25°C (Ω)	R.C. 100kHz 105°C (mA _{rms})	L.C. 20°C 2 min. (µA)	P/N
39	4 x 7	22	0.850	130	3	ESY396M6R3AB2AA
47	5 x 7	22	0.700	175	3	ESY476M6R3AC2AA
56	5 x 7	22	0.560	190	3	ESY566M6R3AC2AA
68	5 x 7	22	0.430	210	4	ESY686M6R3AC2AA
100	5 x 11	22	0.430	200	6	ESY107M6R3AC3AA
100	6 x 7	22	0.350	240	6	ESY107M6R3AE2AA
120	5 x 11	22	0.380	220	7	ESY127M6R3AC3AA
120	6 x 7	22	0.290	270	7	ESY127M6R3AE2AA
150	5 x 11	22	0.300	250	9	ESY157M6R3AC3AA
150	6 x 7	22	0.230	300	9	ESY157M6R3AE2AA
180	8 x 7	22	0.180	340	11	ESY187M6R3AG1AA
220	8 x 7	22	0.150	380	14	ESY227M6R3AG1AA
270	6 x 11	22	0.160	370	17	ESY277M6R3AE3AA
330	6 x 11	22	0.130	410	21	ESY337M6R3AE3AA
470	8 x 11	22	0.086	680	30	ESY477M6R3AG3AA
560	8 x 11	22	0.072	760	35	ESY567M6R3AG3AA
680	8 x 14	22	0.062	900	43	ESY687M6R3AG7AA
820	8 x 16	22	0.056	1000	52	ESY827M6R3AG8AA
1000	10 x 12	22	0.053	1030	63	ESY108M6R3AH1AA
1200	8 x 20	22	0.041	1250	76	ESY128M6R3AG6AA
1200	10 x 15	22	0.038	1430	76	ESY128M6R3AH2AA
1500	10 x 19	22	0.026	1820	94	ESY158M6R3AH4AA
1800	10 x 25	22	0.025	1940	113	ESY188M6R3AH5AA
2200	10 x 25	22	0.023	2150	139	ESY228M6R3AH5AA
2700	13 x 20	22	0.022	2230	170	ESY278M6R3AL3AA
3300	13 x 20	22	0.021	2360	208	ESY338M6R3AL3AA
3900	13 x 25	22	0.018	2770	246	ESY398M6R3AL4AA
4700	13 x 30	22	0.016	3290	296	ESY478M6R3AL8AA
5600	13 x 36	22	0.015	3400	353	ESY568M6R3AL6AA
5600	16 x 20	22	0.018	3140	353	ESY568M6R3AM5AA
6800	16 x 25	22	0.016	3460	428	ESY688M6R3AM7AA

For capacitor whose capacitance exceeds 1000 µF the value of D.F. (%) is increased by 2% for every addition of 1000 µF

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Rated cap. 120 Hz 20°C (μF)	Case size DxL (mm)	10 Vdc Rated voltage - 13 Vdc Surge voltage				P/N
		D.F. 120 Hz 25°C (tgδ %)	Z 100 kHz 25°C (Ω)	R.C. 100kHz 105°C (mA _{rms})	L.C. 20°C 2 min. (μA)	
27	4 x 7	19	0.890	130	3	ESY276M010AB2AA
33	5 x 7	19	0.750	160	3	ESY336M010AC2AA
39	5 x 7	19	0.640	175	4	ESY396M010AC2AA
47	5 x 7	19	0.530	190	5	ESY476M010AC2AA
56	5 x 7	19	0.440	210	6	ESY566M010AC2AA
68	5 x 11	19	0.440	210	7	ESY686M010AC3AA
100	5 x 11	19	0.300	250	10	ESY107M010AC3AA
120	6 x 7	19	0.230	300	12	ESY127M010AE2AA
150	8 x 7	19	0.180	345	15	ESY157M010AG2AA
180	8 x 7	19	0.150	380	18	ESY187M010AG2AA
220	6 x 11	19	0.130	410	22	ESY227M010AE3AA
270	8 x 11	19	0.120	580	27	ESY277M010AG3AA
330	8 x 11	19	0.100	640	33	ESY337M010AG3AA
470	8 x 11	19	0.072	760	47	ESY477M010AG3AA
560	8 x 16	19	0.068	910	56	ESY567M010AG8AA
560	10 x 12	19	0.064	940	56	ESY567M010AH1AA
680	8 x 16	19	0.056	1000	68	ESY687M010AG8AA
680	10 x 12	19	0.053	1030	68	ESY687M010AH1AA
820	8 x 20	19	0.050	1130	82	ESY827M010AG6AA
820	10 x 15	19	0.046	1300	82	ESY827M010AH2AA
1000	8 x 20	19	0.041	1250	100	ESY108M010AG6AA
1000	10 x 15	19	0.038	1430	100	ESY108M010AH2AA
1200	10 x 19	19	0.026	1820	120	ESY128M010AH4AA
1500	10 x 25	19	0.023	2150	150	ESY158M010AH5AA
1800	13 x 20	19	0.022	2230	180	ESY188M010AL3AA
2200	13 x 20	19	0.021	2360	220	ESY228M010AL3AA
2700	13 x 25	19	0.020	2510	270	ESY278M010AL4AA
3300	13 x 25	19	0.018	2770	330	ESY338M010AL4AA
3900	13 x 30	19	0.016	3290	390	ESY398M010AL8AA
3900	16 x 20	19	0.018	3140	390	ESY398M010AM5AA
4700	13 x 36	19	0.015	3400	470	ESY478M010AL6AA
5600	16 x 25	19	0.016	3460	560	ESY568M010AM7AA

For capacitor whose capacitance exceeds 1000 μF the value of D.F. (%) is increased by 2% for every addition of 1000 μF

SINGLE-ENDED LEADS - Very low Impedance 105°C / 1000 to 5000 h

Rated cap. 120 Hz 20°C (μF)	Case size DxL (mm)	16 Vdc Rated voltage - 20 Vdc Surge voltage			L.C. 20°C 2 min. (μA)	P/N
		D.F. 120 Hz 25°C (tgδ %)	Z 100 kHz 25°C (Ω)	R.C. 100kHz 105°C (mA _{rms})		
18	4 x 7	16	0.920	130	3	ESY186M016AB2AA
27	5 x 7	16	0.610	190	4	ESY276M016AC2AA
33	5 x 7	16	0.450	210	5	ESY336M016AC2AA
39	5 x 11	16	0.430	205	6	ESY396M016AC3AA
47	5 x 11	16	0.360	230	7	ESY476M016AC3AA
56	5 x 11	16	0.340	250	9	ESY566M016AC3AA
68	6 x 7	16	0.240	300	11	ESY686M016AE2AA
100	6 x 11	16	0.160	370	16	ESY107M016AE3AA
100	8 x 7	16	0.180	350	16	ESY107M016AG1AA
120	6 x 11	16	0.130	410	19	ESY127M016AE3AA
120	8 x 7	16	0.150	380	19	ESY127M016AG1AA
150	8 x 11	16	0.120	510	24	ESY157M016AG3AA
180	8 x 11	16	0.110	560	29	ESY187M016AG3AA
220	8 x 11	16	0.100	620	35	ESY227M016AG3AA
270	8 x 11	16	0.088	690	43	ESY277M016AG3AA
330	8 x 11	16	0.072	760	53	ESY337M016AG3AA
470	8 x 16	16	0.056	1000	75	ESY477M016AG8AA
470	10 x 12	16	0.053	1030	75	ESY477M016AH1AA
560	8 x 20	16	0.049	1140	90	ESY567M016AG6AA
560	10 x 15	16	0.046	1300	90	ESY567M016AH2AA
680	8 x 20	16	0.041	1250	109	ESY687M016AG6AA
680	10 x 15	16	0.038	1430	109	ESY687M016AH2AA
820	10 x 19	16	0.032	1650	131	ESY827M016AH4AA
1000	10 x 19	16	0.026	1820	160	ESY108M016AH4AA
1200	10 x 25	16	0.023	2150	192	ESY128M016AH5AA
1500	13 x 20	16	0.021	2360	240	ESY158M016AL3AA
1800	13 x 25	16	0.020	2510	288	ESY188M016AL4AA
2200	13 x 25	16	0.018	2770	352	ESY228M016AL4AA
2700	13 x 30	16	0.016	3290	432	ESY278M016AL8AA
2700	16 x 20	16	0.018	3140	432	ESY278M016AM5AA
3300	13 x 36	16	0.015	3400	528	ESY338M016AL6AA
3900	16 x 25	16	0.016	3460	624	ESY398M016AM7AA

For capacitor whose capacitance exceeds 1000 μF the value of D.F. (%) is increased by 2% for every addition of 1000 μF

SINGLE-ENDED LEADS - Very low Impedance 105°C / 1000 to 5000 h

Rated cap. 120 Hz 20°C (μF)	Case size DxL (mm)	25 Vdc Rated voltage - 32 Vdc Surge voltage			L.C. 20°C 2 min. (μA)	P/N
		D.F. 120 Hz 25°C (tgδ %)	Z 100 kHz 25°C (Ω)	R.C. 100kHz 105°C (mA _{rms})		
15	4 x 7	14	0.940	130	4	ESY156M025AB2AA
18	5 x 7	14	0.690	170	4	ESY186M025AC2AA
27	5 x 7	14	0.460	210	7	ESY276M025AC2AA
33	5 x 11	14	0.420	220	8	ESY336M025AC3AA
39	5 x 11	14	0.360	230	10	ESY396M025AC3AA
47	5 x 11	14	0.300	250	12	ESY476M025AC3AA
56	6 x 7	14	0.240	300	14	ESY566M025AE2AA
68	6 x 11	14	0.190	340	17	ESY686M025AE3AA
68	8 x 7	14	0.220	310	17	ESY686M025AG1AA
100	6 x 11	14	0.130	410	25	ESY107M025AE3AA
100	8 x 7	14	0.150	380	25	ESY107M025AG1AA
120	8 x 11	14	0.120	560	30	ESY127M025AG3AA
150	8 x 11	14	0.105	630	37	ESY157M025AG3AA
180	8 x 11	14	0.088	690	45	ESY187M025AG3AA
220	8 x 11	14	0.072	760	55	ESY227M025AG3AA
270	8 x 16	14	0.068	900	67	ESY277M025AG8AA
270	10 x 12	14	0.065	930	67	ESY277M025AH1AA
330	8 x 16	14	0.056	1000	82	ESY337M025AG8AA
330	10 x 12	14	0.053	1030	82	ESY337M025AH1AA
470	8 x 20	14	0.041	1250	117	ESY477M025AG6AA
470	10 x 15	14	0.038	1430	117	ESY477M025AH2AA
560	10 x 19	14	0.032	1650	140	ESY567M025AH4AA
680	10 x 19	14	0.026	1820	170	ESY687M025AH4AA
820	10 x 25	14	0.023	2150	205	ESY827M025AH5AA
1000	13 x 20	14	0.021	2360	250	ESY108M025AL3AA
1200	13 x 25	14	0.020	2510	300	ESY128M025AL4AA
1500	13 x 25	14	0.018	2770	375	ESY158M025AL4AA
1800	13 x 30	14	0.016	3290	450	ESY188M025AL8AA
1800	16 x 20	14	0.018	3140	450	ESY188M025AM5AA
2200	13 x 36	14	0.015	3400	550	ESY228M025AL6AA
2700	16 x 25	14	0.016	3460	675	ESY278M025AM7AA

For capacitor whose capacitance exceeds 1000 μF the value of D.F. (%) is increased by 2% for every addition of 1000 μF

SINGLE-ENDED LEADS - Very low Impedance 105°C / 1000 to 5000 h

Rated cap. 120 Hz 20°C (μF)	Case size DxL (mm)	35 Vdc Rated voltage - 44 Vdc Surge voltage				P/N
		D.F. 120 Hz 25°C (tgδ %)	Z 100 kHz 25°C (Ω)	R.C. 100kHz 105°C (mA _{rms})	L.C. 20°C 2 min. (μA)	
10	4 x 7	12	0.960	130	3	ESY106M035AB2AA
15	5 x 7	12	0.570	190	5	ESY156M035AC2AA
18	5 x 7	12	0.470	210	6	ESY186M035AC2AA
27	5 x 11	12	0.370	230	9	ESY276M035AC3AA
33	5 x 11	12	0.320	250	11	ESY336M035AC3AA
39	6 x 7	12	0.250	300	14	ESY396M035AE2AA
47	6 x 11	12	0.150	380	16	ESY476M035AE3AA
47	8 x 7	12	0.190	350	16	ESY476M035AG1AA
56	6 x 11	12	0.130	410	20	ESY566M035AE3AA
56	8 x 7	12	0.160	380	20	ESY566M035AG1AA
68	8 x 11	12	0.120	510	24	ESY686M035AG3AA
100	8 x 11	12	0.105	620	35	ESY107M035AG3AA
120	8 x 11	12	0.088	680	42	ESY127M035AG3AA
150	8 x 11	12	0.072	760	52	ESY157M035AG3AA
180	8 x 16	12	0.068	910	63	ESY187M035AG8AA
180	10 x 12	12	0.065	930	63	ESY187M035AH1AA
220	8 x 16	12	0.056	1000	77	ESY227M035AG8AA
220	10 x 12	12	0.053	1030	77	ESY227M035AH1AA
270	8 x 20	12	0.041	1250	94	ESY277M035AG6AA
330	10 x 15	12	0.038	1430	115	ESY337M035AH2AA
470	10 x 19	12	0.026	1820	164	ESY477M035AH4AA
560	10 x 25	12	0.023	2150	196	ESY567M035AH5AA
680	13 x 20	12	0.021	2360	238	ESY687M035AL3AA
820	13 x 25	12	0.020	2510	287	ESY827M035AL4AA
1000	13 x 25	12	0.018	2770	350	ESY108M035AL4AA
1200	13 x 30	12	0.016	3290	420	ESY128M035AL8AA
1200	16 x 20	12	0.018	3140	420	ESY128M035AM5AA
1500	13 x 36	12	0.015	3400	525	ESY158M035AL6AA
1800	16 x 25	12	0.016	3460	630	ESY188M035AM7AA

Rated cap. 120 Hz 20°C (μF)	Case size DxL (mm)	50 Vdc Rated voltage - 63 Vdc Surge voltage				P/N
		D.F. 120 Hz 25°C (tgδ %)	Z 100 kHz 25°C (Ω)	R.C. 100kHz 105°C (mA _{rms})	L.C. 20°C 2 min. (μA)	
5.6	4 x 7	10	1.000	130	3	ESY565M050AB2AA
6.8	5 x 7	10	0.740	170	3	ESY685M050AC2AA
10	5 x 7	10	0.500	210	5	ESY106M050AC2AA
15	5 x 11	10	0.480	215	7	ESY156M050AC3AA
15	6 x 7	10	0.380	220	7	ESY156M050AE2AA
22	5 x 11	10	0.340	240	11	ESY226M050AC3AA
22	6 x 7	10	0.260	300	11	ESY226M050AE2AA
27	8 x 7	10	0.210	340	13	ESY276M050AG1AA
33	8 x 7	10	0.170	380	16	ESY336M050AG1AA
39	6 x 11	10	0.160	330	19	ESY396M050AE3AA
47	6 x 11	10	0.150	360	23	ESY476M050AE3AA
56	6 x 11	10	0.140	390	28	ESY566M050AE3AA
68	8 x 11	10	0.110	600	34	ESY686M050AG3AA
82	8 x 11	10	0.090	660	41	ESY826M050AG3AA
100	8 x 11	10	0.074	730	50	ESY107M050AG3AA
120	8 x 16	10	0.065	950	60	ESY127M050AG8AA
150	10 x 12	10	0.061	980	75	ESY157M050AH1AA
180	8 x 20	10	0.046	1190	90	ESY187M050AG6AA
220	10 x 15	10	0.042	1370	110	ESY227M050AH2AA
270	10 x 19	10	0.030	1580	135	ESY277M050AH4AA
330	10 x 25	10	0.028	1870	165	ESY337M050AH5AA
390	13 x 20	10	0.028	1870	195	ESY397M050AL3AA
470	13 x 20	10	0.027	2050	235	ESY477M050AL3AA
560	13 x 25	10	0.023	2410	280	ESY567M050AL4AA
680	13 x 30	10	0.021	2860	340	ESY687M050AL8AA
820	13 x 36	10	0.019	2960	410	ESY827M050AL6AA
820	16 x 20	10	0.023	2730	410	ESY827M050AM5AA
1000	16 x 32	10	0.021	3350	500	ESY108M050AM2AA

For capacitor whose capacitance exceeds 1000 μF the value of D.F. (%) is increased by 2% for every addition of 1000 μF

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Rated cap. 120 Hz 20°C (μF)	Case size DxL (mm)	63 Vdc Rated voltage - 79 Vdc Surge voltage				P/N
		D.F. 120 Hz 25°C (tgδ %)	Z 100 kHz 25°C (Ω)	R.C. 100kHz 105°C (mA _{rms})	L.C. 20°C 2 min. (μA)	
15	5 x 11	9	0.880	170	9	ESY156M063AC3AA
22	6 x 11	9	0.650	220	14	ESY226M063AE3AA
27	6 x 11	9	0.430	240	17	ESY276M063AE3AA
33	6 x 11	9	0.350	270	21	ESY336M063AE3AA
39	8 x 11	9	0.310	385	24	ESY396M063AG3AA
47	8 x 11	9	0.260	420	30	ESY476M063AG3AA
56	8 x 11	9	0.220	500	35	ESY566M063AG3AA
68	8 x 16	9	0.190	610	43	ESY686M063AG8AA
68	10 x 12	9	0.180	625	43	ESY686M063AH1AA
82	8 x 16	9	0.160	670	52	ESY826M063AG8AA
82	10 x 12	9	0.150	690	52	ESY826M063AH1AA
100	10 x 15	9	0.120	800	63	ESY107M063AH2AA
120	8 x 20	9	0.120	820	75	ESY127M063AG6AA
120	10 x 15	9	0.110	950	75	ESY127M063AH2AA
150	10 x 19	9	0.096	1010	94	ESY157M063AH4AA
150	13 x 16	9	0.098	1040	94	ESY157M063AL2AA
180	10 x 19	9	0.080	1100	113	ESY187M063AH4AA
180	13 x 16	9	0.082	1140	113	ESY187M063AL2AA
220	10 x 25	9	0.073	1300	139	ESY227M063AH5AA
270	13 x 20	9	0.060	1500	170	ESY277M063AL3AA
330	13 x 25	9	0.043	1850	208	ESY337M063AL4AA
390	13 x 30	9	0.047	2050	245	ESY397M063AL8AA
390	16 x 20	9	0.054	1810	245	ESY397M063AM5AA
470	13 x 30	9	0.039	2250	296	ESY477M063AL8AA
470	16 x 20	9	0.045	1990	296	ESY477M063AM5AA
560	13 x 36	9	0.035	2450	353	ESY567M063AL6AA
560	16 x 25	9	0.032	2550	353	ESY567M063AM7AA
680	13 x 40	9	0.029	2780	428	ESY687M063AL7AA
680	18 x 20	9	0.038	2450	428	ESY687M063AN4AA
820	16 x 32	9	0.026	2810	517	ESY827M063AM2AA
820	18 x 25	9	0.031	2780	517	ESY827M063AN5AA
1000	16 x 36	9	0.021	2840	630	ESY108M063AM3AA
1000	18 x 32	9	0.025	3270	630	ESY108M063AN1AA
1200	16 x 40	9	0.019	3340	756	ESY128M063AM4AA
1200	18 x 36	9	0.020	3310	756	ESY128M063AN2AA
1500	18 x 40	9	0.018	3420	945	ESY158M063AN3AA

For capacitor whose capacitance exceeds 1000 μF the value of D.F. (%) is increased by 2% for every addition of 1000 μF

SINGLE-ENDED LEADS - Very low Impedance 105°C / 1000 to 5000 h

Rated cap. 120 Hz 20°C (μF)	Case size DxL (mm)	100 Vdc Rated voltage - 125 Vdc Surge voltage				P/N
		D.F. 120 Hz 25°C (tgδ %)	Z 100 kHz 25°C (Ω)	R.C. 100kHz 105°C (mA _{rms})	L.C. 20°C 2 min. (μA)	
6.8	5 x 11	8	1.400	125	7	ESY685M100AC3AA
10	6 x 11	8	0.950	170	10	ESY106M100AE3AA
15	6 x 11	8	0.570	210	15	ESY156M100AE3AA
22	8 x 11	8	0.440	330	22	ESY226M100AG3AA
27	8 x 11	8	0.360	360	27	ESY276M100AG3AA
33	8 x 14	8	0.300	375	33	ESY336M100AG7AA
39	8 x 16	8	0.250	450	39	ESY396M100AG8AA
47	10 x 12	8	0.240	450	47	ESY476M100AH1AA
56	8 x 20	8	0.190	570	56	ESY566M100AG6AA
68	10 x 15	8	0.180	580	68	ESY686M100AH2AA
82	10 x 19	8	0.130	750	82	ESY686M100AH4AA
82	13 x 16	8	0.130	740	82	ESY826M100AL2AA
100	10 x 25	8	0.120	880	100	ESY107M100AH5AA
120	13 x 20	8	0.094	1050	120	ESY127M100AL3AA
150	13 x 25	8	0.085	1100	150	ESY157M100AL4AA
180	13 x 25	8	0.071	1200	180	ESY187M100AL4AA
220	13 x 30	8	0.063	1410	220	ESY227M100AL8AA
220	16 x 20	8	0.071	1300	220	ESY227M100AM5AA
270	13 x 36	8	0.052	1560	270	ESY277M100AL6AA
270	16 x 25	8	0.053	1600	270	ESY277M100AM7AA
270	18 x 20	8	0.069	1470	270	ESY277M100AN4AA
330	13 x 40	8	0.046	1700	330	ESY337M100AL7AA
390	16 x 32	8	0.041	1750	390	ESY397M100AM2AA
390	18 x 25	8	0.049	1620	390	ESY397M100AN5AA
470	16 x 36	8	0.033	1890	470	ESY477M100AM3AA
470	18 x 32	8	0.039	1780	470	ESY477M100AN1AA
560	16 x 40	8	0.030	2080	560	ESY567M100AM4AA
560	18 x 36	8	0.031	2060	560	ESY567M100AN2AA
680	18 x 40	8	0.028	2570	680	ESY687M100AN3AA