

### SINGLE-ENDED LEADS - Super miniature 5mm height 105°C / 1000 h

#### Description

Capacitors for high density printed circuit board.

#### Applications

Coupling, decoupling, by-pass, filtering in VTR, camera, car audio, mini-audio equipments.

#### Marking

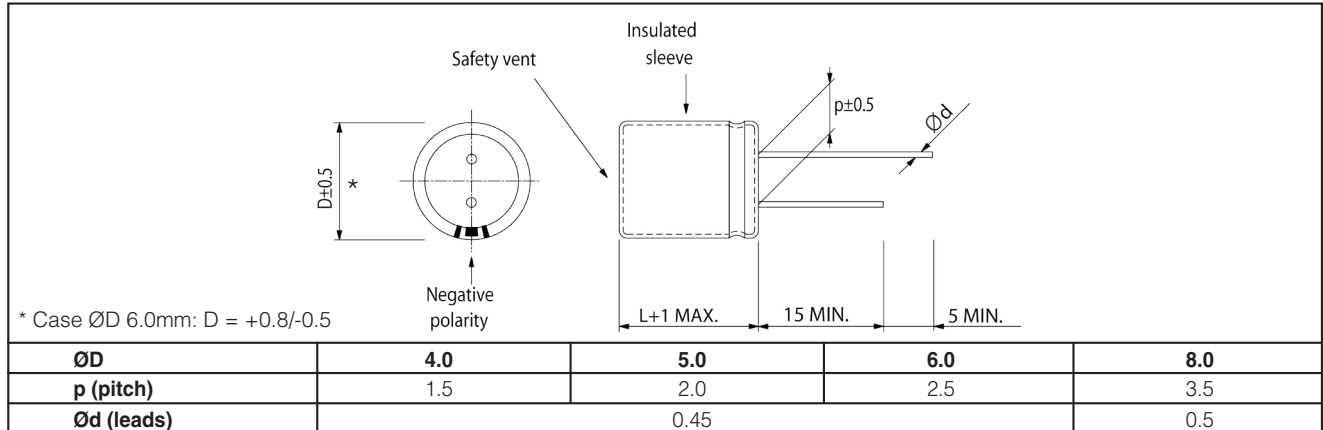
ARCOTRONICS' logo

Series: (ES5), Operating temperature: (105°C)

Rated capacitance: ( $\mu\text{F}$ ), Rated voltage: (Vdc)

Negative polarity: (white line), Date code

#### Diagram of dimensions (Units=mm)



#### Electrical characteristics

Rated voltage	6.3 to 50 Vdc
Operating temperature	-40 to +105°C
Capacitance range	0.1 $\mu\text{F}$ to 330 $\mu\text{F}$
Capacitance tolerance	$\pm 20\%$ at 120Hz / 20°C
Endurance test	1000 hours (see conditions in Test method and performance)
Leakage current	$I = 0.01 CV (\mu\text{A})$ or $3\mu\text{A}$ whichever is greater C = rated capacitance ( $\mu\text{F}$ ); V = rated voltage (Vdc) (after than D.C. rated working voltage at 20°C has been applied for 2 min)

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

Capacitance range	50 Hz	120 Hz	300 Hz	1 kHz	10 to 100 kHz
0.1 to 47 $\mu\text{F}$	0.75	1.00	1.20	1.30	1.50
100 to 330 $\mu\text{F}$	0.75	1.00	1.10	1.15	1.20

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

Temperature	40°C	65°C	85°C	105°C
Multiplier factors	1.50	1.40	1.20	1.00

#### Test method and performance

Conditions	Load life test	Shelf life test
Temperature: Test duration: Ripple current: Voltage:	105°C 1000 hours max ripple current at 120Hz 105°C specified in the table. the sum of D.C. voltage and the peak A.C. voltage must not exceed the rated voltage of capacitor.	105°C 500 hours no ripple current applied. no voltage applied.
<b>Performance</b>	The following specifications will be satisfied when the capacitors are restored at 20°C	
Capacitance change: Dissipation factor: Leakage current:	within 20% of initial value. not exceed 200% of the initial requirement. not exceed initial requirement.	within 20% of initial value. not exceed 200% of the initial requirement. not exceed initial requirement.

### SINGLE-ENDED LEADS - Super miniature 5mm height 105°C / 1000 h

#### 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 %)	R.C. 120 Hz 105°C (mA <sub>rms</sub> )	L.C. 20°C 2 min. (μA)	Arcotronics P/N
10	4 x 5	24	18	3	ES5106M6R3AB1AA
22	4 x 5	24	28	3	ES5226M6R3AB1AA
33	4 x 5	24	33	3	ES5336M6R3AB1AA
47	4 x 5	24	35	3	ES5476M6R3AB1AA
47	5 x 5	24	45	3	ES5476M6R3AC1AA
100	6 x 5	24	70	6	ES5107M6R3AE1AA
220	6 x 5	24	90	14	ES5227M6R3AE1AA
330	8 x 5	24	115	21	ES5337M6R3AG5AA

10 Vdc Rated voltage - 13 Vdc Surge voltage					
Rated cap. 120 Hz 20°C (μF)	Case size DxL (mm)	D.F. 120 Hz 25°C (tgδ %)	R.C. 120 Hz 105°C (mA <sub>rms</sub> )	L.C. 20°C 2 min. (μA)	Arcotronics P/N
10	4 x 5	20	20	3	ES5106M010AB1AA
22	5 x 5	20	33	3	ES5226M010AC1AA
33	5 x 5	20	41	3	ES5336M010AC1AA
47	5 x 5	20	46	5	ES5476M010AC1AA
100	6 x 5	20	80	10	ES5107M010AE1AA

16 Vdc Rated voltage - 20 Vdc Surge voltage					
Rated cap. 120 Hz 20°C (μF)	Case size DxL (mm)	D.F. 120 Hz 25°C (tgδ %)	R.C. 120 Hz 105°C (mA <sub>rms</sub> )	L.C. 20°C 2 min. (μA)	Arcotronics P/N
4.7	4 x 5	16	20	3	ES5475M016AB1AA
10	4 x 5	16	23	3	ES5106M016AB1AA
22	4 x 5	16	29	3	ES5226M016AB1AA
22	5 x 5	16	37	3	ES5226M016AC1AA
33	5 x 5	16	44	5	ES5336M016AC1AA
33	6 x 5	16	49	5	ES5336M016AE1AA
47	5 x 5	16	54	7	ES5476M016AC1AA
47	6 x 5	16	58	7	ES5476M016AE1AA
100	6 x 5	16	85	16	ES5107M016AE1AA

25 Vdc Rated voltage - 32 Vdc Surge voltage					
Rated cap. 120 Hz 20°C (μF)	Case size DxL (mm)	D.F. 120 Hz 25°C (tgδ %)	R.C. 120 Hz 105°C (mA <sub>rms</sub> )	L.C. 20°C 2 min. (μA)	Arcotronics P/N
4.7	4 x 5	14	16	3	ES5475M025AB1AA
10	4 x 5	14	20	3	ES5106M025AB1AA
10	5 x 5	14	27	3	ES5106M025AC1AA
22	6 x 5	14	42	5	ES5226M025AE1AA
33	5 x 5	14	45	8	ES5336M025AC1AA
33	6 x 5	14	53	8	ES5336M025AE1AA
47	6 x 5	14	65	12	ES5476M025AE1AA

35 Vdc Rated voltage - 44 Vdc Surge voltage					
Rated cap. 120 Hz 20°C (μF)	Case size DxL (mm)	D.F. 120 Hz 25°C (tgδ %)	R.C. 120 Hz 105°C (mA <sub>rms</sub> )	L.C. 20°C 2 min. (μA)	Arcotronics P/N
4.7	4 x 5	12	18	3	ES5475M035AB1AA
10	5 x 5	12	30	3	ES5106M035AC1AA
22	6 x 5	12	48	8	ES5226M035AE1AA

50 Vdc Rated voltage - 63 Vdc Surge voltage					
Rated cap. 120 Hz 20°C (μF)	Case size DxL (mm)	D.F. 120 Hz 25°C (tgδ %)	R.C. 120 Hz 105°C (mA <sub>rms</sub> )	L.C. 20°C 2 min. (μA)	Arcotronics P/N
0.1	4 x 5	10	1	3	ES5104M050AB1AA
0.22	4 x 5	10	2	3	ES5224M050AB1AA
0.33	4 x 5	10	3	3	ES5334M050AB1AA
0.47	4 x 5	10	4	3	ES5474M050AB1AA
1.0	4 x 5	10	9	3	ES5105M050AB1AA
2.2	4 x 5	10	13	3	ES5225M050AB1AA
3.3	4 x 5	10	17	3	ES5335M050AB1AA
4.7	5 x 5	10	20	3	ES5475M050AC1AA
10	6 x 5	10	33	5	ES5106M050AE1AA

### SINGLE-ENDED LEADS - Miniature 7mm height 105°C / 1000 h

#### Description

Capacitors for high density printed circuit board.

#### Applications

Coupling, by-pass, filtering in portable micro computers, disk drivers, small calculators and audio equipments.

#### Marking

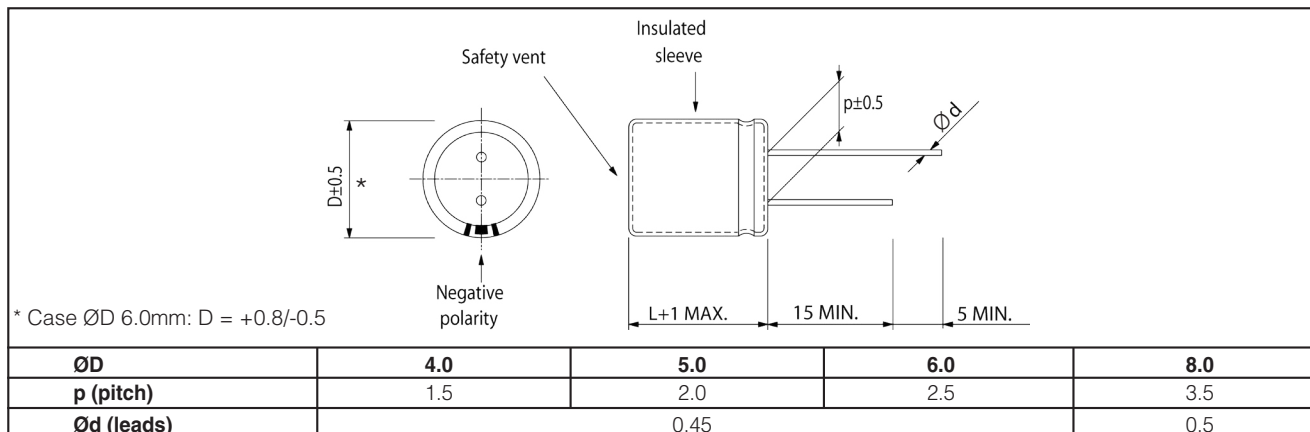
ARCOTRONICS' logo

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

Rated capacitance: ( $\mu\text{F}$ ), Rated voltage: (Vdc)

Negative polarity: (white line), Date code

#### Diagram of dimensions (Units=mm)



#### Electrical characteristics

Rated voltage	6.3 to 50 Vdc
Operating temperature	-40 to +105°C
Capacitance range	0.1 $\mu\text{F}$ to 220 $\mu\text{F}$
Capacitance tolerance	$\pm 20\%$ at 120Hz / 20°C
Endurance test	1000 hours (see conditions in Test method and performance)
Leakage current	$I = 0.01 CV$ or $3\mu\text{A}$ whichever is greater C = rated capacitance ( $\mu\text{F}$ ); V = rated voltage (Vdc) (after than D.C. rated working voltage at 20°C has been applied for 2 min)

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

Capacitance range	50 Hz	120 Hz	300 Hz	1 kHz	10 to 100 kHz
0.1 to 47 $\mu\text{F}$	0.75	1.00	1.20	1.30	1.50
100 to 220 $\mu\text{F}$	0.75	1.00	1.10	1.15	1.20

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

Temperature	40°C	65°C	85°C	105°C
Multiplier factors	1.90	1.70	1.30	1.00

#### Test method and performance

Conditions	Load life test	Shelf life test
Temperature: Test duration: Ripple current: Voltage:	105°C 1000 hours max ripple current at 120Hz 105°C specified in the table. the sum of D.C. voltage and the peak A.C. voltage must not exceed the rated voltage of capacitor.	105°C 500 hours no ripple current applied. no voltage applied.
<b>Performance</b>	The following specifications will be satisfied when the capacitors are restored at 20°C	
Capacitance change: Dissipation factor: Leakage current:	within 20% of initial value. not exceed 200% of the initial requirement. not exceed initial requirement.	within 20% of initial value. not exceed 200% of the initial requirement. not exceed initial requirement.

### SINGLE-ENDED LEADS - Miniature 7mm height 105°C / 1000 h

#### 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 %)	R.C. 120 Hz 105°C (mA <sub>rms</sub> )	L.C. 20°C 2 min. (μA)	Arcotronics P/N
22	4 x 7	24	37	3	ESS226M6R3AB2AA
33	5 x 7	24	42	3	ESS336M6R3AC2AA
47	5 x 7	24	55	3	ESS476M6R3AC2AA
100	5 x 7	24	75	6	ESS107M6R3AC2AA
100	6 x 7	24	90	6	ESS107M6R3AE2AA
220	6 x 7	24	130	14	ESS227M6R3AE2AA

10 Vdc Rated voltage - 13 Vdc Surge voltage					
Rated cap. 120 Hz 20°C (μF)	Case size DxL (mm)	D.F. 120 Hz 25°C (tgδ %)	R.C. 120 Hz 105°C (mA <sub>rms</sub> )	L.C. 20°C 2 min. (μA)	Arcotronics P/N
22	4 x 7	20	31	3	ESS226M010AB2AA
22	5 x 7	20	38	3	ESS226M010AC2AA
33	4 x 7	20	39	3	ESS336M010AB2AA
33	5 x 7	20	47	3	ESS336M010AC2AA
47	5 x 7	20	60	5	ESS476M010AC2AA
100	5 x 7	20	85	10	ESS107M010AC2AA
100	6 x 7	20	100	10	ESS107M010AE2AA
100	8 x 7	20	200	10	ESS107M010AG1AA
220	6 x 7	20	135	22	ESS227M010AE2AA

16 Vdc Rated voltage - 20 Vdc Surge voltage					
Rated cap. 120 Hz 20°C (μF)	Case size DxL (mm)	D.F. 120 Hz 25°C (tgδ %)	R.C. 120 Hz 105°C (mA <sub>rms</sub> )	L.C. 20°C 2 min. (μA)	Arcotronics P/N
4.7	4 x 7	17	19	3	ESS475M016AB2AA
10	4 x 7	17	29	3	ESS106M016AB2AA
22	4 x 7	17	36	3	ESS226M016AB2AA
22	5 x 7	17	44	3	ESS226M016AC2AA
33	4 x 7	17	50	5	ESS336M016AB2AA
33	5 x 7	17	57	5	ESS336M016AC2AA
47	5 x 7	17	75	7	ESS476M016AC2AA
47	6 x 7	17	77	7	ESS476M016AE2AA
100	6 x 7	17	110	16	ESS107M016AE2AA
220	8 x 7	17	140	35	ESS227M016AG1AA

25 Vdc Rated voltage - 32 Vdc Surge voltage					
Rated cap. 120 Hz 20°C (μF)	Case size DxL (mm)	D.F. 120 Hz 25°C (tgδ %)	R.C. 120 Hz 105°C (mA <sub>rms</sub> )	L.C. 20°C 2 min. (μA)	Arcotronics P/N
4.7	4 x 7	15	24	3	ESS475M025AB2AA
10	4 x 7	15	33	3	ESS106M025AB2AA
10	5 x 7	15	35	3	ESS106M025AC2AA
22	5 x 7	15	51	5	ESS226M025AC2AA
22	6 x 7	15	53	5	ESS226M025AE2AA
33	6 x 7	15	65	8	ESS336M025AE2AA
47	6 x 7	15	79	12	ESS476M025AE2AA
100	6 x 7	15	120	25	ESS107M025AE2AA

35 Vdc Rated voltage - 44 Vdc Surge voltage					
Rated cap. 120 Hz 20°C (μF)	Case size DxL (mm)	D.F. 120 Hz 25°C (tgδ %)	R.C. 120 Hz 105°C (mA <sub>rms</sub> )	L.C. 20°C 2 min. (μA)	Arcotronics P/N
4.7	4 x 7	12	24	3	ESS475M035AB2AA
10	4 x 7	12	34	3	ESS106M035AB2AA
10	5 x 7	12	36	3	ESS106M035AC2AA
22	6 x 7	12	57	8	ESS226M035AE2AA
33	6 x 7	12	70	11	ESS336M035AE2AA
47	6 x 7	12	81	16	ESS476M035AE2AA

50 Vdc Rated voltage - 63 Vdc Surge voltage					
Rated cap. 120 Hz 20°C (μF)	Case size DxL (mm)	D.F. 120 Hz 25°C (tgδ %)	R.C. 120 Hz 105°C (mA <sub>rms</sub> )	L.C. 20°C 2 min. (μA)	Arcotronics P/N
0.1	4 x 7	10	1	3	ESS104M050AB2AA
0.22	4 x 7	10	2	3	ESS224M050AB2AA
0.33	4 x 7	10	3	3	ESS334M050AB2AA
0.47	4 x 7	10	5	3	ESS474M050AB2AA
1.0	4 x 7	10	10	3	ESS105M050AB2AA
2.2	4 x 7	10	19	3	ESS225M050AB2AA
3.3	4 x 7	10	24	3	ESS335M050AB2AA
4.7	4 x 7	10	29	3	ESS475M050AB2AA
4.7	5 x 7	10	31	3	ESS475M050AC2AA
10	5 x 7	10	45	5	ESS106M050AC2AA
22	6 x 7	10	65	11	ESS226M050AE2AA

63 Vdc Rated voltage - 79 Vdc Surge voltage					
Rated cap. 120 Hz 20°C (μF)	Case size DxL (mm)	D.F. 120 Hz 25°C (tgδ %)	R.C. 120 Hz 105°C (mA <sub>rms</sub> )	L.C. 20°C 2 min. (μA)	Arcotronics P/N
0.1	4 x 7	8	1	3	ESS104M063AB2AA
0.22	4 x 7	8	2	3	ESS224M063AB2AA
0.33	4 x 7	8	4	3	ESS334M063AB2AA
0.47	4 x 7	8	6	3	ESS474M063AB2AA
1.0	4 x 7	8	13	3	ESS105M063AB2AA
2.2	4 x 7	8	21	3	ESS225M063AB2AA
3.3	4 x 7	8	26	3	ESS335M063AB2AA
4.7	6 x 7	8	33	3	ESS475M063AE2AA
10	6 x 7	8	50	6	ESS106M063AE2AA

### SINGLE-ENDED LEADS - General purpose 85°C / 2000 h

#### Description

Capacitors for high density printed circuit board.

#### Applications

Coupling, decoupling, by-pass, filtering.

#### Features

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

#### Marking

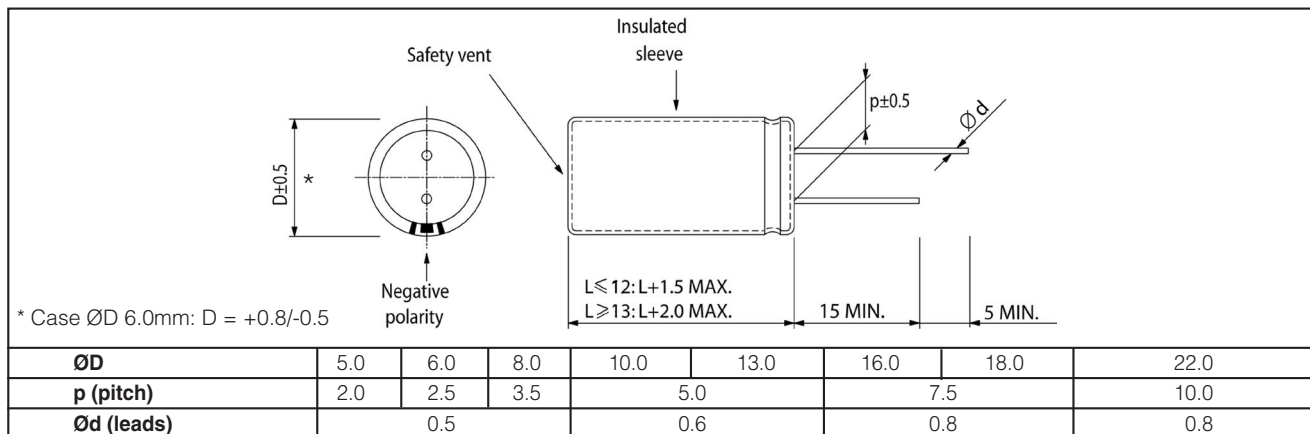
ARCOTRONICS' logo

Series: (ESK), Operating temperature: (85°C)

Rated capacitance ( $\mu\text{F}$ ), Rated voltage: (Vdc),

Negative polarity: (white line), Date code

#### Diagram of dimensions (Units=mm)



#### Electrical characteristics

Rated voltage	6.3 to 100 Vdc	160 to 450 Vdc
Operating temperature	-40 to +85°C	-25 to +85°C
Capacitance range	0.1 $\mu\text{F}$ to 22000 $\mu\text{F}$	0.47 $\mu\text{F}$ to 470 $\mu\text{F}$ .
Capacitance tolerance	$\pm 20\%$ at 120Hz / 20°C	
Endurance test	2000 hours (see conditions in Test method and performance)	
Leakage current	$I = 0.01 CV (\mu\text{A})$ or $3\mu\text{A}$ whichever is greater	$I = 0.03 CV (\mu\text{A}) + 10\mu\text{A}$
	$C = \text{rated capacitance } (\mu\text{F}); V = \text{rated voltage (Vdc)}$ (after that DC rated voltage at 20°C has been applied for 2 min)	

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

Rated voltage	Capacitance range	50 Hz	120 Hz	300 Hz	1 kHz	10 to 100 kHz
6.3 to 100 Vdc	0.1 to 68 $\mu\text{F}$	0.75	1.00	1.20	1.30	1.45
6.3 to 100 Vdc	100 to 680 $\mu\text{F}$	0.75	1.00	1.10	1.15	1.25
6.3 to 100 Vdc	1000 to 22000 $\mu\text{F}$	0.75	1.00	1.05	1.10	1.15
160 to 450 Vdc	0.47 to 220 $\mu\text{F}$	0.80	1.00	1.25	1.40	1.40
160 to 450 Vdc	330 to 470 $\mu\text{F}$	0.80	1.00	1.10	1.13	1.15

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

Temperature	50°C	70°C	85°C
Multiplier factors	1.30	1.15	1.00

### SINGLE-ENDED LEADS - General purpose 85°C / 2000 h

#### Test method and performance

Conditions	Load life test	Shelf life test
Temperature: Test duration: Ripple current:	85°C 2000 hours max ripple current at 120Hz 85°C specified in the table.	85°C 1000 hours no ripple current applied
Voltage:	the sum of D.C. voltage and the peak A.C. voltage must not exceed the rated voltage of capacitor.	no voltage applied.
<b>Performance</b>	The following specifications will be satisfied when the capacitors are restored at 20°C	
Capacitance change: Dissipation factor: Leakage current:	within 20% of initial value. not exceed 200% of the initial requirement. not exceed initial requirement.	within 20% 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 %)	R.C. 120 Hz 85°C (mA <sub>rms</sub> )	L.C. 20°C 2 min. (μA)	Arcotronics P/N
22	5 x 11	22	35	3	ESK226M6R3AC3AA
33	5 x 11	22	55	3	ESK336M6R3AC3AA
47	5 x 11	22	75	3	ESK476M6R3AC3AA
100	5 x 11	22	130	6	ESK107M6R3AC3AA
220	5 x 11	22	200	14	ESK227M6R3AC3AA
220	6 x 11	22	240	14	ESK227M6R3AE3AA
330	6 x 11	22	260	21	ESK337M6R3AE3AA
330	8 x 11	22	300	21	ESK337M6R3AG3AA
470	6 x 11	22	330	30	ESK477M6R3AE3AA
470	8 x 11	22	380	30	ESK477M6R3AG3AA
1000	8 x 11	22	460	63	ESK108M6R3AG3AA
1000	10 x 12	22	580	63	ESK108M6R3AH1AA
2200	10 x 19	22	840	139	ESK228M6R3AH4AA
2200	13 x 20	22	1050	139	ESK228M6R3AL3AA
3300	10 x 19	22	1000	208	ESK338M6R3AH4AA
3300	13 x 20	22	1250	208	ESK338M6R3AL3AA
4700	13 x 20	22	1300	296	ESK478M6R3AL3AA
4700	16 x 25	22	1700	296	ESK478M6R3AM7AA
6800	16 x 25	22	1900	428	ESK688M6R3AM7AA
10000	16 x 25	22	1900	630	ESK109M6R3AM7AA
10000	16 x 32	22	2250	630	ESK109M6R3AM2AA
15000	16 x 36	22	2500	945	ESK159M6R3AM3AA
15000	18 x 36	22	2880	945	ESK159M6R3AN2AA
22000	18 x 40	22	3650	1386	ESK229M6R3AN3AA

10 Vdc Rated voltage - 13 Vdc Surge voltage					
Rated cap. 120 Hz 20°C (μF)	Case size DxL (mm)	D.F. 120 Hz 25°C (tgδ %)	R.C. 120 Hz 85°C (mA <sub>rms</sub> )	L.C. 20°C 2 min. (μA)	Arcotronics P/N
4.7	5 x 11	19	20	3	ESK475M010AC3AA
10	5 x 11	19	35	3	ESK106M010AC3AA
22	5 x 11	19	55	3	ESK226M010AC3AA
33	5 x 11	19	80	3	ESK336M010AC3AA
47	5 x 11	19	95	5	ESK476M010AC3AA
100	5 x 11	19	180	10	ESK107M010AC3AA
220	5 x 11	19	230	22	ESK227M010AC3AA
220	6 x 11	19	250	22	ESK227M010AE3AA
330	8 x 11	19	330	33	ESK337M010AG3AA
470	6 x 11	19	360	47	ESK477M010AE3AA
470	8 x 11	19	400	47	ESK477M010AG3AA
680	8 x 15	19	430	68	ESK687M010AG4AA
680	10 x 15	19	460	68	ESK687M010AH2AA
1000	10 x 12	19	580	100	ESK108M010AH1AA
1000	10 x 15	19	630	100	ESK108M010AH2AA
2200	10 x 19	19	880	220	ESK228M010AH4AA
2200	13 x 20	19	1100	220	ESK228M010AL3AA
3300	13 x 20	19	1250	330	ESK338M010AL3AA
3300	13 x 25	19	1400	330	ESK338M010AL4AA
4700	13 x 25	19	1500	470	ESK478M010AL4AA
4700	16 x 25	19	1800	470	ESK478M010AM7AA
6800	16 x 25	19	1900	680	ESK688M010AM7AA
6800	16 x 32	19	2150	680	ESK688M010AM2AA
10000	16 x 36	19	2500	1000	ESK109M010AM3AA
10000	18 x 36	19	2500	1000	ESK109M010AN2AA
15000	18 x 36	19	2950	1500	ESK159M010AN2AA
22000	22 x 40	19	3700	2200	ESK229M010AQ4AA

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 - General purpose 85°C / 2000 h

16 Vdc Rated voltage - 20 Vdc Surge voltage					
Rated cap. 120 Hz 20°C (μF)	Case size DxL (mm)	D.F. 120 Hz 25°C (tgδ %)	R.C. 120 Hz 85°C (mA <sub>rms</sub> )	L.C. 20°C 2 min. (μA)	Arcotronics P/N
1.0	5 x 11	16	9.3	3	ESK105M016AC3AA
4.7	5 x 11	16	25	3	ESK475M016AC3AA
10	5 x 11	16	40	3	ESK106M016AC3AA
22	5 x 11	16	75	4	ESK226M016AC3AA
33	5 x 11	16	110	5	ESK336M016AC3AA
47	5 x 11	16	130	7	ESK476M016AC3AA
100	5 x 11	16	185	16	ESK107M016AC3AA
100	6 x 11	16	185	16	ESK107M016AE3AA
220	6 x 11	16	320	35	ESK227M016AE3AA
220	8 x 11	16	320	35	ESK227M016AG3AA
330	8 x 11	16	360	53	ESK337M016AG3AA
470	8 x 11	16	400	75	ESK477M016AG3AA
470	10 x 12	16	470	75	ESK477M016AH1AA
680	10 x 15	16	560	109	ESK687M016AH2AA
1000	10 x 15	16	630	160	ESK108M016AH2AA
1000	10 x 19	16	790	160	ESK108M016AH4AA
2200	13 x 20	16	1100	352	ESK228M016AL3AA
2200	13 x 25	16	1350	352	ESK228M016AL4AA
3300	13 x 25	16	1400	528	ESK338M016AL4AA
3300	16 x 25	16	1700	528	ESK338M016AM7AA
4700	16 x 25	16	1800	752	ESK478M016AM7AA
4700	16 x 32	16	2100	752	ESK478M016AM2AA
6800	16 x 36	16	2200	1088	ESK688M016AM3AA
6800	18 x 36	16	2500	1088	ESK688M016AN2AA
10000	18 x 36	16	2700	1600	ESK109M016AN2AA
15000	22 x 40	16	3150	2400	ESK159M016AQ4AA
22000	22 x 40	16	3800	3520	ESK229M016AQ4AA

25 Vdc Rated voltage - 32 Vdc Surge voltage					
Rated cap. 120 Hz 20°C (μF)	Case size DxL (mm)	D.F. 120 Hz 25°C (tgδ %)	R.C. 120 Hz 85°C (mA <sub>rms</sub> )	L.C. 20°C 2 min. (μA)	Arcotronics P/N
4.7	5 x 11	14	30	3	ESK475M025AC3AA
10	5 x 11	14	50	3	ESK106M025AC3AA
22	5 x 11	14	90	5	ESK226M025AC3AA
33	5 x 11	14	115	8	ESK336M025AC3AA
47	5 x 11	14	135	12	ESK476M025AC3AA
100	6 x 11	14	200	25	ESK107M025AE3AA
220	8 x 11	14	290	55	ESK227M025AG3AA
220	10 x 12	14	340	55	ESK227M025AH1AA
330	8 x 15	14	380	82	ESK337M025AG4AA
330	10 x 12	14	420	82	ESK337M025AH1AA
330	10 x 15	14	420	82	ESK337M025AH2AA
470	10 x 12	14	460	117	ESK477M025AH1AA
470	10 x 15	14	540	117	ESK477M025AH2AA
1000	10 x 19	14	760	250	ESK108M025AH4AA
1000	13 x 20	14	950	250	ESK108M025AL3AA
2200	13 x 25	14	1300	550	ESK228M025AL4AA
2200	16 x 25	14	1550	550	ESK228M025AM7AA
3300	16 x 25	14	1660	825	ESK338M025AM7AA
3300	16 x 32	14	1950	825	ESK338M025AM2AA
4700	16 x 32	14	1950	1175	ESK478M025AM2AA
4700	18 x 36	14	2360	1175	ESK478M025AN2AA
6800	18 x 36	14	2550	1700	ESK688M025AN2AA
10000	22 x 40	14	2800	2500	ESK109M025AQ4AA
15000	22 x 40	14	3200	3750	ESK159M025AQ4AA

35 Vdc Rated voltage - 44 Vdc Surge voltage					
Rated cap. 120 Hz 20°C (μF)	Case size DxL (mm)	D.F. 120 Hz 25°C (tgδ %)	R.C. 120 Hz 85°C (mA <sub>rms</sub> )	L.C. 20°C 2 min. (μA)	Arcotronics P/N
4.7	5 x 11	12	35	3	ESK475M035AC3AA
10	5 x 11	12	60	3	ESK106M035AC3AA
22	5 x 11	12	95	8	ESK226M035AC3AA
33	5 x 11	12	120	11	ESK336M035AC3AA
47	5 x 11	12	120	16	ESK476M035AC3AA
47	6 x 11	12	140	16	ESK476M035AE3AA
100	6 x 11	12	200	35	ESK107M035AE3AA
100	8 x 11	12	230	35	ESK107M035AG3AA
220	8 x 11	12	290	77	ESK227M035AG3AA
220	10 x 12	12	370	77	ESK227M035AH1AA
330	10 x 12	12	420	115	ESK337M035AH1AA
330	10 x 15	12	490	115	ESK337M035AH2AA
470	10 x 15	12	480	164	ESK477M035AH2AA
470	10 x 19	12	510	164	ESK477M035AH4AA
470	13 x 20	12	640	164	ESK477M035AL3AA
1000	13 x 20	12	950	350	ESK108M035AL3AA
1000	13 x 25	12	1100	350	ESK108M035AL4AA
2200	16 x 25	12	1600	770	ESK228M035AM7AA
2200	16 x 32	12	1800	770	ESK228M035AM2AA
3300	16 x 36	12	1970	1155	ESK338M035AM3AA
3300	18 x 36	12	2220	1155	ESK338M035AN2AA
4700	18 x 36	12	2400	1645	ESK478M035AN2AA
6800	22 x 40	12	2600	2380	ESK688M035AQ4AA

50 Vdc Rated voltage - 63 Vdc Surge voltage					
Rated cap. 120 Hz 20°C (μF)	Case size DxL (mm)	D.F. 120 Hz 25°C (tgδ %)	R.C. 120 Hz 85°C (mA <sub>rms</sub> )	L.C. 20°C 2 min. (μA)	Arcotronics P/N
0.1	5 x 11	10	1	3	ESK104M050AC3AA
0.22	5 x 11	10	2	3	ESK224M050AC3AA
0.33	5 x 11	10	3	3	ESK334M050AC3AA
0.47	5 x 11	10	5	3	ESK474M050AC3AA
1.0	5 x 11	10	10	3	ESK105M050AC3AA
2.2	5 x 11	10	23	3	ESK225M050AC3AA
3.3	5 x 11	10	35	3	ESK335M050AC3AA
4.7	5 x 11	10	40	3	ESK475M050AC3AA
10	5 x 11	10	65	5	ESK106M050AC3AA
22	5 x 11	10	100	11	ESK226M050AC3AA
33	6 x 11	10	125	16	ESK336M050AE3AA
47	6 x 11	10	140	23	ESK476M050AE3AA
47	8 x 11	10	150	23	ESK476M050AG3AA
100	8 x 11	10	230	50	ESK107M050AG3AA
100	10 x 12	10	250	50	ESK107M050AH1AA
220	10 x 12	10	360	110	ESK227M050AH1AA
220	10 x 15	10	440	110	ESK227M050AH2AA
330	10 x 15	10	490	165	ESK337M050AH2AA
330	10 x 19	10	580	165	ESK337M050AH4AA
470	10 x 19	10	610	235	ESK477M050AH4AA
470	13 x 20	10	760	235	ESK477M050AL3AA
1000	13 x 25	10	1100	500	ESK108M050AL4AA
1000	16 x 25	10	1350	500	ESK108M050AM7AA
2200	16 x 36	10	1850	1100	ESK228M050AM3AA
2200	18 x 36	10	2090	1100	ESK228M050AN2AA
3300	18 x 36	10	2170	1650	ESK338M050AN2AA
3300	18 x 40	10	2400	1650	ESK338M050AN3AA
4700	22 x 35	10	2500	2350	ESK478M050AQ3AA
4700	22 x 40	10	2500	2350	ESK478M050AQ4AA

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 - General purpose 85°C / 2000 h

63 Vdc Rated voltage - 79 Vdc Surge voltage					
Rated cap. 120 Hz 20°C (μF)	Case size DxL (mm)	D.F. 120 Hz 25°C (tgδ %)	R.C. 120 Hz 85°C (mA <sub>rms</sub> )	L.C. 20°C 2 min. (μA)	Arcotronics P/N
0.47	5 x 11	9	5	3	ESK474M063AC3AA
1.0	5 x 11	9	10	3	ESK105M063AC3AA
2.2	5 x 11	9	29	3	ESK225M063AC3AA
3.3	5 x 11	9	40	3	ESK335M063AC3AA
4.7	5 x 11	9	45	3	ESK475M063AC3AA
10	5 x 11	9	70	6	ESK106M063AC3AA
22	6 x 11	9	115	14	ESK226M063AE3AA
33	6 x 11	9	130	21	ESK336M063AE3AA
33	8 x 11	9	140	21	ESK336M063AG3AA
47	6 x 11	9	190	30	ESK476M063AE3AA
47	8 x 11	9	190	30	ESK476M063AG3AA
100	10 x 12	9	300	63	ESK107M063AH1AA
220	10 x 15	9	410	139	ESK227M063AH2AA
220	10 x 19	9	490	139	ESK227M063AH4AA
330	10 x 19	9	540	208	ESK337M063AH4AA
330	13 x 20	9	680	208	ESK337M063AL3AA
470	13 x 25	9	880	296	ESK477M063AL4AA
1000	16 x 25	9	1310	630	ESK108M063AM7AA
1000	16 x 32	9	1550	630	ESK108M063AM2AA
2200	18 x 40	9	2200	1386	ESK228M063AN3AA
3300	22 x 40	9	2500	2079	ESK338M063AQ4AA

100 Vdc Rated voltage - 125 Vdc Surge voltage					
Rated cap. 120 Hz 20°C (μF)	Case size DxL (mm)	D.F. 120 Hz 25°C (tgδ %)	R.C. 120 Hz 85°C (mA <sub>rms</sub> )	L.C. 20°C 2 min. (μA)	Arcotronics P/N
0.47	5 x 11	8	10	3	ESK474M100AC3AA
1.0	5 x 11	8	21	3	ESK105M100AC3AA
2.2	5 x 11	8	30	3	ESK225M100AC3AA
3.3	5 x 11	8	45	3	ESK335M100AC3AA
4.7	5 x 11	8	50	5	ESK475M100AC3AA
10	6 x 11	8	75	10	ESK106M100AE3AA
22	8 x 11	8	130	12	ESK226M100AG3AA
33	8 x 11	8	140	33	ESK336M100AG3AA
33	10 x 12	8	170	33	ESK336M100AH1AA
47	10 x 12	8	190	47	ESK476M100AH1AA
47	10 x 15	8	230	47	ESK476M100AH2AA
100	10 x 19	8	400	160	ESK107M100AH4AA
220	13 x 25	8	710	220	ESK227M100AL4AA
330	13 x 25	8	720	330	ESK337M100AL4AA
330	16 x 25	8	860	330	ESK337M100AM7AA
470	16 x 25	8	1100	470	ESK477M100AM7AA
1000	16 x 32	8	1350	1000	ESK108M100AM2AA
1000	18 x 40	8	1680	1000	ESK108M100AN3AA
2200	22 x 40	8	2300	2200	ESK228M100AQ4AA

160 Vdc Rated voltage - 200 Vdc Surge voltage					
Rated cap. 120 Hz 20°C (μF)	Case size DxL (mm)	D.F. 120 Hz 25°C (tgδ %)	R.C. 120 Hz 85°C (mA <sub>rms</sub> )	L.C. 20°C 2 min. (μA)	Arcotronics P/N
0.47	5 x 11	15	12	12	ESK474M160AC3AA
1.0	5 x 11	15	17	15	ESK105M160AC3AA
2.2	6 x 11	15	26	20	ESK225M160AE3AA
3.3	6 x 11	15	30	26	ESK335M160AE3AA
3.3	8 x 11	15	35	26	ESK335M160AG3AA
4.7	6 x 11	15	32	32	ESK475M160AE3AA
4.7	8 x 11	15	40	32	ESK475M160AG3AA
10	8 x 11	15	50	58	ESK106M160AG3AA
10	10 x 12	15	65	58	ESK106M160AH1AA
22	10 x 15	15	110	116	ESK226M160AH2AA
33	10 x 19	15	150	168	ESK336M160AH4AA
47	13 x 20	15	180	236	ESK476M160AL3AA
100	13 x 25	15	250	490	ESK107M160AL4AA
100	16 x 25	15	300	490	ESK107M160AM7AA
220	16 x 32	15	450	1066	ESK227M160AM2AA
220	16 x 36	15	510	1066	ESK227M160AM3AA
330	18 x 36	15	540	1594	ESK337M160AN2AA
330	18 x 40	15	600	1594	ESK337M160AN3AA
470	22 x 40	15	900	2266	ESK477M160AQ4AA

200 Vdc Rated voltage - 250 Vdc Surge voltage					
Rated cap. 120 Hz 20°C (μF)	Case size DxL (mm)	D.F. 120 Hz 25°C (tgδ %)	R.C. 120 Hz 85°C (mA <sub>rms</sub> )	L.C. 20°C 2 min. (μA)	Arcotronics P/N
0.47	5 x 11	15	14	13	ESK474M200AC3AA
1.0	5 x 11	15	19	16	ESK105M200AC3AA
2.2	6 x 11	15	22	23	ESK225M200AE3AA
2.2	8 x 11	15	27	23	ESK225M200AG3AA
3.3	6 x 11	15	30	30	ESK335M200AE3AA
3.3	8 x 11	15	37	30	ESK335M200AG3AA
4.7	8 x 11	15	36	38	ESK475M200AG3AA
4.7	10 x 12	15	45	38	ESK475M200AH1AA
10	10 x 12	15	57	70	ESK106M200AH1AA
10	10 x 15	15	70	70	ESK106M200AH2AA
22	10 x 15	15	120	142	ESK226M200AH2AA
33	10 x 19	15	160	208	ESK336M200AH4AA
47	13 x 20	15	160	292	ESK476M200AL3AA
47	13 x 25	15	190	292	ESK476M200AL4AA
100	16 x 25	15	330	610	ESK107M200AM7AA
220	18 x 32	15	600	1330	ESK227M200AN1AA
220	18 x 36	15	600	1330	ESK227M200AN2AA
330	18 x 36	15	800	1990	ESK337M200AN2AA
330	18 x 40	15	800	1990	ESK337M200AN3AA
470	18 x 40	15	1000	2830	ESK477M200AN3AA

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 - General purpose 85°C / 2000 h

250 Vdc Rated voltage - 300 Vdc Surge voltage					
Rated cap. 120 Hz 20°C (μF)	Case size DxL (mm)	D.F. 120 Hz 25°C (tgδ %)	R.C. 120 Hz 85°C (mA <sub>rms</sub> )	L.C. 20°C 2 min. (μA)	Arcotronics P/N
0.47	5 x 11	15	14	13	ESK474M250AC3AA
1.0	6 x 11	15	19	17	ESK105M250AE3AA
2.2	6 x 11	15	24	26	ESK225M250AE3AA
2.2	8 x 11	15	30	26	ESK225M250AG3AA
3.3	8 x 11	15	30	35	ESK335M250AG3AA
3.3	10 x 12	15	38	35	ESK335M250AH1AA
4.7	8 x 11	15	36	45	ESK475M250AG3AA
4.7	10 x 12	15	45	45	ESK475M250AH1AA
10	10 x 12	15	70	85	ESK106M250AH1AA
10	10 x 15	15	70	85	ESK106M250AH2AA
22	10 x 19	15	130	175	ESK226M250AH4AA
33	13 x 20	15	140	257	ESK336M250AL3AA
33	13 x 25	15	160	257	ESK336M250AL4AA
47	13 x 25	15	210	362	ESK476M250AL4AA
100	16 x 32	15	310	760	ESK107M250AM2AA
220	18 x 40	15	600	1660	ESK227M250AN3AA

350 Vdc Rated voltage - 400 Vdc Surge voltage					
Rated cap. 120 Hz 20°C (μF)	Case size DxL (mm)	D.F. 120 Hz 25°C (tgδ %)	R.C. 120 Hz 85°C (mA <sub>rms</sub> )	L.C. 20°C 2 min. (μA)	Arcotronics P/N
0.47	5 x 11	20	14	15	ESK474M350AC3AA
1.0	6 x 11	20	19	20	ESK105M350AE3AA
2.2	8 x 11	20	33	33	ESK225M350AG3AA
3.3	8 x 11	20	33	45	ESK335M350AG3AA
3.3	10 x 12	20	39	45	ESK335M350AH1AA
4.7	10 x 12	20	39	59	ESK475M350AH1AA
4.7	10 x 15	20	45	59	ESK475M350AH2AA
10	10 x 15	20	70	115	ESK106M350AH2AA
22	13 x 20	20	130	241	ESK226M350AL3AA
33	13 x 25	20	170	356	ESK336M350AL4AA
47	16 x 25	20	220	503	ESK476M350AM7AA
100	18 x 36	20	360	1060	ESK107M350AN2AA

400 Vdc Rated voltage - 450 Vdc Surge voltage					
Rated cap. 120 Hz 20°C (μF)	Case size DxL (mm)	D.F. 120 Hz 25°C (tgδ %)	R.C. 120 Hz 85°C (mA <sub>rms</sub> )	L.C. 20°C 2 min. (μA)	Arcotronics P/N
0.47	6 x 11	20	14	16	ESK474M400AE3AA
1.0	6 x 11	20	19	22	ESK105M400AE3AA
1.0	8 x 11	20	19	22	ESK105M400AG3AA
2.2	8 x 11	20	26	36	ESK225M400AG3AA
2.2	10 x 12	20	33	36	ESK225M400AH1AA
3.3	10 x 12	20	40	50	ESK335M400AH1AA
4.7	10 x 15	20	45	66	ESK475M400AH2AA
10	10 x 19	20	56	130	ESK106M400AH4AA
10	13 x 20	20	70	130	ESK106M400AL3AA
22	13 x 25	20	110	274	ESK226M400AL4AA
22	16 x 25	20	130	274	ESK226M400AM7AA
33	16 x 25	20	170	406	ESK336M400AM7AA
33	18 x 20	20	130	406	ESK336M400AN4AA
47	16 x 25	20	180	574	ESK476M400AM7AA
47	16 x 32	20	220	574	ESK476M400AM2AA
100	18 x 36	20	360	1210	ESK107M400AN2AA

450 Vdc Rated voltage - 500 Vdc Surge voltage					
Rated cap. 120 Hz 20°C (μF)	Case size DxL (mm)	D.F. 120 Hz 25°C (tgδ %)	R.C. 120 Hz 85°C (mA <sub>rms</sub> )	L.C. 20°C 2 min. (μA)	Arcotronics P/N
0.47	6 x 11	20	14	16	ESK474M450AE3AA
1.0	8 x 11	20	19	23	ESK105M450AG3AA
2.2	10 x 12	20	33	40	ESK225M450AH1AA
3.3	10 x 15	20	42	54	ESK335M450AH2AA
4.7	10 x 15	20	50	73	ESK475M450AH2AA
10	13 x 20	20	60	145	ESK106M450AL3AA
10	13 x 25	20	75	145	ESK106M450AL4AA
22	16 x 25	20	130	307	ESK226M450AM7AA
33	16 x 32	20	160	455	ESK336M450AM2AA
33	16 x 36	20	180	455	ESK336M450AM3AA
47	18 x 36	20	200	644	ESK476M450AN2AA
47	18 x 40	20	230	644	ESK476M450AN3AA
100	22 x 40	20	370	1360	ESK107M450AQ4AA

### SINGLE-ENDED LEADS - General purpose 105°C / 1000 h

#### Description

Capacitors for high density printed circuit board.

#### Applications

Coupling, decoupling, by-pass, filtering.

#### Features

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

#### Marking

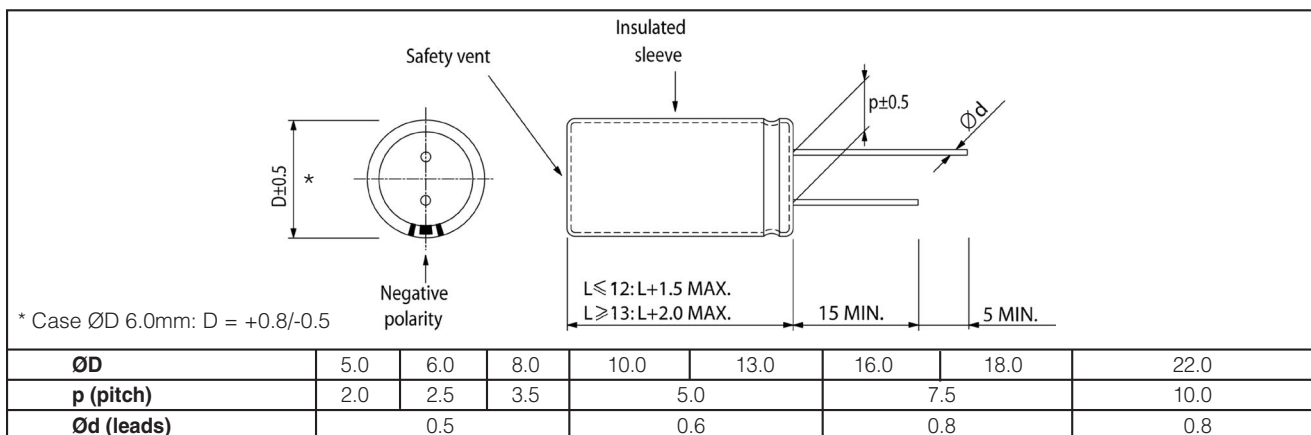
ARCOTRONICS' logo

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

Rated capacitance ( $\mu\text{F}$ ), Rated voltage: (Vdc),

Negative polarity: (white line), Date code

#### Diagram of dimensions (Units=mm)



#### Electrical characteristics

Rated voltage	6.3 to 100 Vdc	160 to 450 Vdc
Operating temperature	-40 to +105°C	-25 to +105°C
Capacitance range	0.47 $\mu\text{F}$ to 22000 $\mu\text{F}$	0.47 $\mu\text{F}$ to 470 $\mu\text{F}$ .
Capacitance tolerance	$\pm 20\%$ at 120Hz / 20°C	
Endurance test	1000 hours (see conditions in Test method and performance)	
Leakage current	$I = 0.01 CV$ ( $\mu\text{A}$ )	$I = 0.03 CV$ ( $\mu\text{A}$ ) + 10 $\mu\text{A}$
	C = rated capacitance ( $\mu\text{F}$ ); V = rated voltage (Vdc) (after that DC rated voltage at 20°C has been applied for 2 min)	

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

Rated voltage	Capacitance range	50 Hz	120 Hz	300 Hz	1 kHz	10 to 100 kHz
6.3 to 100 Vdc	0.47 to 68 $\mu\text{F}$	0.75	1.00	1.20	1.30	1.45
6.3 to 100 Vdc	100 to 680 $\mu\text{F}$	0.75	1.00	1.10	1.15	1.25
6.3 to 100 Vdc	1000 to 22000 $\mu\text{F}$	0.75	1.00	1.05	1.10	1.15
160 to 450 Vdc	0.47 to 470 $\mu\text{F}$	0.80	1.00	1.05	1.10	1.50

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

Temperature	65°C	85°C	105°C
<b>Multiplier factors</b>	1.80	1.40	1.00

### SINGLE-ENDED LEADS - General purpose 105°C / 1000 h

#### Test method and performance

Conditions	Load life test	Shelf life test
Temperature: Test duration: Ripple current:	105°C 1000 hours max ripple current at 120Hz 105°C specified in the table.	105°C 500 hours no ripple current applied.
Voltage:	the sum of D.C. voltage and the peak A.C. voltage must not exceed the rated voltage of capacitor.	no voltage applied.
<b>Performance</b>	The following specifications will be satisfied when the capacitors are restored at 20°C	
Capacitance change: Dissipation factor: Leakage current:	within 20% of initial value. not exceed 200% of the initial requirement. not exceed initial requirement.	within 20% 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 %)	R.C. 120 Hz 105°C (mA <sub>rms</sub> )	L.C. 20°C 2 min. (μA)	Arcotronics P/N
47	5 x 11	26	60	6	ESE476M6R3AC3AA
68	5 x 11	26	75	7	ESE686M6R3AC3AA
100	5 x 11	26	100	9	ESE107M6R3AC3AA
150	5 x 11	26	120	12	ESE157M6R3AC3AA
220	5 x 11	26	140	17	ESE227M6R3AC3AA
220	6 x 11	26	165	17	ESE227M6R3AE3AA
330	6 x 11	26	160	24	ESE337M6R3AE3AA
330	8 x 11	26	200	24	ESE337M6R3AG3AA
470	6 x 11	26	220	33	ESE477M6R3AE3AA
470	8 x 11	26	280	33	ESE477M6R3AG3AA
680	10 x 12	26	320	46	ESE687M6R3AH1AA
1000	8 x 11	26	370	66	ESE108M6R3AG3AA
1000	10 x 12	26	470	66	ESE108M6R3AH1AA
1500	10 x 15	26	600	97	ESE158M6R3AH2AA
2200	10 x 19	26	740	142	ESE228M6R3AH4AA
2200	13 x 20	26	930	142	ESE228M6R3AL3AA
3300	10 x 19	26	880	211	ESE338M6R3AH4AA
3300	13 x 20	26	1100	211	ESE338M6R3AL3AA
4700	13 x 25	26	1100	299	ESE478M6R3AL4AA
4700	16 x 15	26	1172	299	ESE478M6R3AM6AA
4700	16 x 25	26	1320	299	ESE478M6R3AM7AA
6800	13 x 25	26	1250	431	ESE688M6R3AL4AA
6800	16 x 25	26	1490	431	ESE688M6R3AM7AA
6800	18 x 16	26	1490	431	ESE688M6R3AN6AA
10000	16 x 25	26	1560	633	ESE109M6R3AM7AA
10000	16 x 32	26	1830	633	ESE109M6R3AM2AA
15000	16 x 36	26	1560	948	ESE159M6R3AM3AA
15000	18 x 36	26	1830	948	ESE159M6R3AN2AA
22000	18 x 40	26	2280	1389	ESE229M6R3AN3AA

10 Vdc Rated voltage - 13 Vdc Surge voltage					
Rated cap. 120 Hz 20°C (μF)	Case size DxL (mm)	D.F. 120 Hz 25°C (tgδ %)	R.C. 120 Hz 105°C (mA <sub>rms</sub> )	L.C. 20°C 2 min. (μA)	Arcotronics P/N
22	5 x 11	22	45	5	ESE226M010AC3AA
33	5 x 11	22	60	6	ESE336M010AC3AA
47	5 x 11	22	75	8	ESE476M010AC3AA
68	5 x 11	22	80	10	ESE686M010AC3AA
100	5 x 11	22	110	13	ESE107M010AC3AA
150	6 x 11	22	130	18	ESE157M010AE3AA
220	6 x 11	22	180	25	ESE227M010AE3AA
330	8 x 11	22	255	36	ESE337M010AG3AA
470	8 x 11	22	305	50	ESE477M010AG3AA
680	10 x 12	22	420	71	ESE687M010AH1AA
1000	10 x 12	22	490	103	ESE108M010AH1AA
1000	10 x 15	22	570	103	ESE108M010AH2AA
1500	10 x 19	22	750	153	ESE158M010AH4AA
2200	10 x 19	22	800	223	ESE228M010AH4AA
2200	13 x 20	22	1010	223	ESE228M010AL3AA
3300	13 x 20	22	1050	333	ESE338M010AL3AA
3300	13 x 25	22	1220	333	ESE338M010AL4AA
4700	13 x 25	22	1190	473	ESE478M010AL4AA
4700	16 x 25	22	1410	473	ESE478M010AM7AA
6800	16 x 25	22	1370	683	ESE688M010AM7AA
6800	16 x 32	22	1610	683	ESE688M010AM2AA
10000	16 x 36	22	1760	1003	ESE109M010AM3AA
10000	18 x 36	22	1980	1003	ESE109M010AN2AA

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 - General purpose 105°C / 1000 h

16 Vdc Rated voltage - 20 Vdc Surge voltage					
Rated cap. 120 Hz 20°C (μF)	Case size DxL (mm)	D.F. 120 Hz 25°C (tgδ %)	R.C. 120 Hz 105°C (mA <sub>rms</sub> )	L.C. 20°C 2 min. (μA)	Arcotronics P/N
10	5 x 11	18	25	5	ESE106M016AC3AA
15	5 x 11	18	40	5	ESE156M016AC3AA
22	5 x 11	18	55	6	ESE226M016AC3AA
33	5 x 11	18	70	8	ESE336M016AC3AA
47	5 x 11	18	85	10	ESE476M016AC3AA
68	5 x 11	18	100	14	ESE686M016AC3AA
100	5 x 11	18	110	19	ESE107M016AC3AA
100	6 x 11	18	135	19	ESE107M016AE3AA
150	8 x 11	18	180	27	ESE157M016AG3AA
220	6 x 11	18	180	38	ESE227M016AE3AA
220	8 x 11	18	235	38	ESE227M016AG3AA
330	8 x 11	18	285	56	ESE337M016AG3AA
470	8 x 11	18	310	78	ESE477M016AG3AA
470	8 x 15	18	395	78	ESE477M016AG4AA
470	10 x 12	18	395	78	ESE477M016AH1AA
680	10 x 15	18	530	112	ESE687M016AH2AA
1000	10 x 15	18	590	163	ESE108M016AH2AA
1000	10 x 19	18	700	163	ESE108M016AH4AA
1500	10 x 19	18	680	243	ESE158M016AH4AA
1500	13 x 20	18	860	243	ESE158M016AL3AA
2200	13 x 20	18	990	355	ESE228M016AL3AA
2200	13 x 25	18	1150	355	ESE228M016AL4AA
3300	13 x 25	18	1140	531	ESE338M016AL4AA
3300	16 x 25	18	1350	531	ESE338M016AM7AA
4700	16 x 25	18	1330	755	ESE478M016AM7AA
4700	16 x 32	18	1560	755	ESE478M016AM2AA
6800	16 x 36	18	1590	1091	ESE688M016AM3AA
6800	18 x 36	18	1790	1091	ESE688M016AN2AA
10000	18 x 36	18	2100	1603	ESE109M016AN2AA

25 Vdc Rated voltage - 32 Vdc Surge voltage					
Rated cap. 120 Hz 20°C (μF)	Case size DxL (mm)	D.F. 120 Hz 25°C (tgδ %)	R.C. 120 Hz 105°C (mA <sub>rms</sub> )	L.C. 20°C 2 min. (μA)	Arcotronics P/N
4.7	5 x 11	16	20	4	ESE475M025AC3AA
6.8	5 x 11	16	25	5	ESE685M025AC3AA
10	5 x 11	16	30	5	ESE106M025AC3AA
15	5 x 11	16	45	7	ESE156M025AC3AA
22	5 x 11	16	60	8	ESE226M025AC3AA
33	5 x 11	16	75	11	ESE336M025AC3AA
47	5 x 11	16	90	15	ESE476M025AC3AA
68	6 x 11	16	125	20	ESE686M025AE3AA
100	6 x 11	16	145	28	ESE107M025AE3AA
150	8 x 11	16	200	40	ESE157M025AG3AA
220	8 x 11	16	200	58	ESE227M025AG3AA
220	10 x 12	16	250	58	ESE227M025AH1AA
330	8 x 15	16	320	85	ESE337M025AG4AA
330	10 x 12	16	355	85	ESE337M025AH1AA
470	10 x 12	16	400	120	ESE477M025AH1AA
470	10 x 15	16	470	120	ESE477M025AH2AA
680	10 x 19	16	650	173	ESE687M025AH4AA
1000	10 x 19	16	680	253	ESE108M025AH4AA
1000	13 x 20	16	855	253	ESE108M025AL3AA
1500	13 x 25	16	1020	378	ESE158M025AL4AA
2200	13 x 25	16	1030	553	ESE228M025AL4AA
2200	16 x 25	16	1230	553	ESE228M025AM7AA
3300	16 x 25	16	1230	828	ESE338M025AM7AA
3300	16 x 32	16	1450	828	ESE338M025AM2AA
4700	16 x 32	16	1420	1178	ESE478M025AM2AA
4700	18 x 36	16	1690	1178	ESE478M025AN2AA
6800	18 x 36	16	1850	1703	ESE688M025AN2AA

35 Vdc Rated voltage - 44 Vdc Surge voltage					
Rated cap. 120 Hz 20°C (μF)	Case size DxL (mm)	D.F. 120 Hz 25°C (tgδ %)	R.C. 120 Hz 105°C (mA <sub>rms</sub> )	L.C. 20°C 2 min. (μA)	Arcotronics P/N
4.7	5 x 11	14	25	5	ESE475M035AC3AA
6.8	5 x 11	14	30	5	ESE685M035AC3AA
10	5 x 11	14	40	6	ESE106M035AC3AA
15	5 x 11	14	50	8	ESE156M035AC3AA
22	5 x 11	14	65	11	ESE226M035AC3AA
33	5 x 11	14	85	14	ESE336M035AC3AA
47	5 x 11	14	95	19	ESE476M035AC3AA
47	6 x 11	14	115	19	ESE476M035AE3AA
68	8 x 11	14	130	27	ESE686M035AG3AA
100	8 x 11	14	190	38	ESE107M035AG3AA
150	10 x 12	14	240	55	ESE157M035AH1AA
220	8 x 15	14	280	80	ESE227M035AG4AA
220	10 x 12	14	315	80	ESE227M035AH1AA
330	10 x 12	14	380	118	ESE337M035AH1AA
330	10 x 15	14	440	118	ESE337M035AH2AA
470	10 x 19	14	490	167	ESE477M035AH4AA
470	13 x 20	14	580	167	ESE477M035AL3AA
680	13 x 20	14	730	241	ESE687M035AL3AA
1000	13 x 20	14	850	353	ESE108M035AL3AA
1000	13 x 25	14	995	353	ESE108M035AL4AA
1500	16 x 25	14	1100	528	ESE158M035AM7AA
2200	16 x 25	14	1230	773	ESE228M035AM7AA
2200	16 x 32	14	1450	773	ESE228M035AM2AA
3300	16 x 36	14	1470	1158	ESE338M035AM3AA
3300	18 x 36	14	1660	1158	ESE338M035AN2AA
4700	18 x 36	14	1580	1648	ESE478M035AN2AA
4700	18 x 40	14	1750	1648	ESE478M035AN3AA

50 Vdc Rated voltage - 63 Vdc Surge voltage					
Rated cap. 120 Hz 20°C (μF)	Case size DxL (mm)	D.F. 120 Hz 25°C (tgδ %)	R.C. 120 Hz 105°C (mA <sub>rms</sub> )	L.C. 20°C 2 min. (μA)	Arcotronics P/N
0.47	5 x 11	12	7	3	ESE474M050AC3AA
1.0	5 x 11	12	12	3	ESE105M050AC3AA
2.2	5 x 11	12	18	4	ESE225M050AC3AA
3.3	5 x 11	12	25	5	ESE335M050AC3AA
4.7	5 x 11	12	30	5	ESE475M050AC3AA
6.8	5 x 11	12	32	6	ESE685M050AC3AA
10	5 x 11	12	50	8	ESE106M050AC3AA
15	5 x 11	12	60	10	ESE156M050AC3AA
22	5 x 11	12	75	14	ESE226M050AC3AA
33	6 x 11	12	105	19	ESE336M050AE3AA
47	6 x 11	12	100	26	ESE476M050AE3AA
47	8 x 11	12	125	26	ESE476M050AG3AA
68	8 x 11	12	159	37	ESE686M050AG3AA
100	8 x 11	12	160	53	ESE107M050AG3AA
100	10 x 12	12	210	53	ESE107M050AH1AA
150	10 x 12	12	289	78	ESE157M050AH1AA
150	10 x 15	12	310	78	ESE157M050AH2AA
220	10 x 15	12	400	113	ESE227M050AH2AA
330	10 x 15	12	450	168	ESE337M050AH2AA
330	10 x 19	12	535	168	ESE337M050AH4AA
470	13 x 20	12	730	238	ESE477M050AL3AA
680	13 x 25	12	860	343	ESE687M050AL4AA
1000	13 x 25	12	930	503	ESE108M050AL4AA
1000	16 x 25	12	1110	503	ESE108M050AM7AA
1500	16 x 32	12	1350	753	ESE158M050AM2AA
2200	16 x 36	12	1360	1103	ESE228M050AM3AA
2200	18 x 36	12	1530	1103	ESE228M050AN2AA
3300	18 x 40	12	1700	1653	ESE338M050AN3AA
4700	22 x 35	12	1900	2353	ESE478M050AQ3AA

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 - General purpose 105°C / 1000 h

63 Vdc Rated voltage - 79 Vdc Surge voltage					
Rated cap. 120 Hz 20°C (μF)	Case size DxL (mm)	D.F. 120 Hz 25°C (tgδ %)	R.C. 120 Hz 105°C (mA <sub>rms</sub> )	L.C. 20°C 2 min. (μA)	Arcotronics P/N
0.47	5 x 11	10	8	3	ESE474M063AC3AA
1.0	5 x 11	10	13	4	ESE105M063AC3AA
2.2	5 x 11	10	20	4	ESE225M063AC3AA
3.3	5 x 11	10	27	5	ESE335M063AC3AA
4.7	5 x 11	10	34	6	ESE475M063AC3AA
6.8	5 x 11	10	37	7	ESE685M063AC3AA
10	5 x 11	10	55	9	ESE106M063AC3AA
15	5 x 11	10	65	12	ESE156M063AC3AA
22	6 x 11	10	90	17	ESE226M063AE3AA
33	6 x 11	10	110	24	ESE336M063AE3AA
33	8 x 11	10	120	24	ESE336M063AG3AA
47	8 x 11	10	155	33	ESE476M063AG3AA
68	10 x 12	10	198	46	ESE686M063AH1AA
100	8 x 15	10	230	66	ESE107M063AG4AA
100	10 x 12	10	260	66	ESE107M063AH1AA
150	10 x 15	10	330	97	ESE157M063AH2AA
220	10 x 15	10	400	142	ESE227M063AH2AA
220	10 x 19	10	460	142	ESE227M063AH4AA
330	13 x 20	10	650	211	ESE337M063AL3AA
470	13 x 20	10	700	299	ESE477M063AL3AA
470	13 x 25	10	800	299	ESE477M063AL4AA
680	13 x 25	10	840	431	ESE687M063AL4AA
680	16 x 25	10	1000	431	ESE687M063AM7AA
1000	16 x 25	10	1020	633	ESE108M063AM7AA
1000	16 x 32	10	1200	633	ESE108M063AM2AA
1500	16 x 32	10	1300	948	ESE158M063AM2AA
1500	16 x 36	10	1450	948	ESE158M063AM3AA

100 Vdc Rated voltage - 125 Vdc Surge voltage					
Rated cap. 120 Hz 20°C (μF)	Case size DxL (mm)	D.F. 120 Hz 25°C (tgδ %)	R.C. 120 Hz 105°C (mA <sub>rms</sub> )	L.C. 20°C 2 min. (μA)	Arcotronics P/N
0.47	5 x 11	10	10	3	ESE474M100AC3AA
1.0	5 x 11	10	15	4	ESE105M100AC3AA
2.2	5 x 11	10	22	5	ESE225M100AC3AA
3.3	5 x 11	10	29	6	ESE335M100AC3AA
4.7	5 x 11	10	37	8	ESE475M100AC3AA
6.8	5 x 11	10	46	10	ESE685M100AC3AA
10	5 x 11	10	55	13	ESE106M100AC3AA
10	6 x 11	10	65	13	ESE106M100AE3AA
15	8 x 11	10	82	18	ESE156M100AG3AA
22	8 x 11	10	115	25	ESE226M100AG3AA
33	8 x 11	10	120	36	ESE336M100AG3AA
33	10 x 12	10	160	36	ESE336M100AH1AA
47	10 x 12	10	180	50	ESE476M100AH1AA
47	10 x 15	10	210	50	ESE476M100AH2AA
68	10 x 15	10	241	71	ESE686M100AH2AA
100	10 x 19	10	385	103	ESE107M100AH4AA
150	13 x 25	10	414	153	ESE157M100AL4AA
220	13 x 25	10	590	223	ESE227M100AL4AA
330	13 x 25	10	600	333	ESE337M100AL4AA
330	16 x 25	10	720	333	ESE337M100AM7AA
470	16 x 25	10	740	473	ESE477M100AM7AA
470	16 x 32	10	875	473	ESE477M100AM2AA
680	16 x 36	10	1200	683	ESE687M100AM3AA
1000	18 x 40	10	1340	1003	ESE108M100AN3AA
1000	22 x 40	10	1500	1003	ESE108M100AQ4AA

160 Vdc Rated voltage - 200 Vdc Surge voltage					
Rated cap. 120 Hz 20°C (μF)	Case size DxL (mm)	D.F. 120 Hz 25°C (tgδ %)	R.C. 120 Hz 105°C (mA <sub>rms</sub> )	L.C. 20°C 2 min. (μA)	Arcotronics P/N
0.47	5 x 11	15	12	12	ESE474M160AC3AA
1.0	5 x 11	15	17	15	ESE105M160AC3AA
2.2	6 x 11	15	25	20	ESE225M160AE3AA
3.3	6 x 11	15	30	26	ESE335M160AE3AA
3.3	8 x 11	15	36	26	ESE335M160AG3AA
4.7	6 x 11	15	34	32	ESE475M160AE3AA
4.7	8 x 11	15	43	32	ESE475M160AG3AA
6.8	10 x 12	15	54	43	ESE685M160AH1AA
10	8 x 15	15	56	58	ESE106M160AG3AA
10	8 x 15	15	70	58	ESE106M160AG4AA
10	10 x 12	15	70	58	ESE106M160AH1AA
15	10 x 15	15	90	82	ESE156M160AH2AA
22	10 x 15	15	130	116	ESE226M160AH2AA
33	10 x 19	15	180	168	ESE336M160AH4AA
47	13 x 20	15	270	236	ESE476M160AL3AA
68	13 x 25	15	300	336	ESE686M160AL4AA
100	13 x 25	15	330	490	ESE107M160AL4AA
100	16 x 25	15	400	490	ESE107M160AM7AA
150	16 x 32	15	435	730	ESE157M160AM2AA
220	16 x 32	15	550	1066	ESE227M160AM2AA
220	16 x 36	15	620	1066	ESE227M160AM3AA
330	18 x 36	15	770	1594	ESE337M160AN2AA
330	18 x 40	15	850	1594	ESE337M160AN3AA
470	22 x 40	15	980	2266	ESE477M160AQ4AA

200 Vdc Rated voltage - 250 Vdc Surge voltage					
Rated cap. 120 Hz 20°C (μF)	Case size DxL (mm)	D.F. 120 Hz 25°C (tgδ %)	R.C. 120 Hz 105°C (mA <sub>rms</sub> )	L.C. 20°C 2 min. (μA)	Arcotronics P/N
0.47	5 x 11	15	14	13	ESE474M200AC3AA
1.0	5 x 11	15	19	16	ESE105M200AC3AA
2.2	6 x 11	15	22	23	ESE225M200AE3AA
2.2	8 x 11	15	28	23	ESE225M200AG3AA
3.3	6 x 11	15	32	30	ESE335M200AE3AA
3.3	8 x 11	15	40	30	ESE335M200AG3AA
4.7	8 x 11	15	40	38	ESE475M200AG3AA
4.7	10 x 12	15	50	38	ESE475M200AH1AA
6.8	10 x 12	15	60	51	ESE685M200AH1AA
10	10 x 12	15	69	70	ESE106M200AH1AA
10	10 x 15	15	80	70	ESE106M200AH2AA
15	10 x 15	15	110	100	ESE156M200AH2AA
22	10 x 15	15	140	142	ESE226M200AH2AA
33	10 x 19	15	190	208	ESE336M200AH4AA
47	13 x 20	15	240	292	ESE476M200AL3AA
47	13 x 25	15	290	292	ESE476M200AL4AA
68	13 x 25	15	330	418	ESE686M200AL4AA
100	16 x 25	15	410	610	ESE107M200AM7AA
150	16 x 36	15	450	910	ESE157M200AM3AA
220	18 x 36	15	580	1330	ESE227M200AN2AA
220	18 x 40	15	650	1330	ESE227M200AN3AA
330	18 x 40	15	780	1990	ESE337M200AN3AA
330	22 x 40	15	920	1990	ESE337M200AQ4AA

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 - General purpose 105°C / 1000 h

250 Vdc Rated voltage - 300 Vdc Surge voltage					
Rated cap. 120 Hz 20°C (μF)	Case size DxL (mm)	D.F. 120 Hz 25°C (tgδ %)	R.C. 120 Hz 105°C (mA <sub>rms</sub> )	L.C. 20°C 2 min. (μA)	Arcotronics P/N
0.47	5 x 11	15	14	13	ESE474M250AC3AA
1.0	6 x 11	15	19	17	ESE105M250AE3AA
2.2	6 x 11	15	23	26	ESE225M250AE3AA
2.2	8 x 11	15	29	26	ESE225M250AG3AA
3.3	8 x 11	15	33	35	ESE335M250AG3AA
3.3	10 x 12	15	42	35	ESE335M250AH1AA
4.7	8 x 11	15	41	45	ESE475M250AG3AA
4.7	10 x 12	15	52	45	ESE475M250AH1AA
6.8	8 x 15	15	57	61	ESE685M250AG4AA
6.8	10 x 12	15	62	61	ESE685M250AH1AA
10	10 x 15	15	88	85	ESE106M250AH2AA
15	10 x 15	15	120	122	ESE156M250AH2AA
22	10 x 19	15	155	175	ESE226M250AH4AA
33	13 x 20	15	170	257	ESE336M250AL3AA
33	13 x 25	15	200	257	ESE336M250AL4AA
47	13 x 25	15	330	362	ESE476M250AL4AA
68	16 x 25	15	350	520	ESE686M250AM7AA
100	16 x 32	15	430	760	ESE107M250AM2AA
150	18 x 40	15	460	1135	ESE157M250AN3AA
220	22 x 40	15	680	1660	ESE227M250AQ4AA

350 Vdc Rated voltage - 400 Vdc Surge voltage					
Rated cap. 120 Hz 20°C (μF)	Case size DxL (mm)	D.F. 120 Hz 25°C (tgδ %)	R.C. 120 Hz 105°C (mA <sub>rms</sub> )	L.C. 20°C 2 min. (μA)	Arcotronics P/N
0.47	5 x 11	20	14	15	ESE474M350AC3AA
1.0	6 x 11	20	20	20	ESE105M350AE3AA
2.2	8 x 11	20	35	33	ESE225M350AG3AA
3.3	8 x 11	20	37	45	ESE335M350AG3AA
3.3	10 x 12	20	47	45	ESE335M350AH1AA
4.7	10 x 12	20	47	59	ESE475M350AH1AA
4.7	10 x 15	20	55	59	ESE475M350AH2AA
6.8	10 x 15	20	65	81	ESE685M350AH2AA
10	10 x 15	20	95	115	ESE106M350AH2AA
15	10 x 19	20	140	167	ESE156M350AH4AA
22	13 x 20	20	165	241	ESE226M350AL3AA
33	13 x 25	20	220	356	ESE336M350AL4AA
47	16 x 25	20	340	503	ESE476M350AM7AA
68	16 x 32	20	370	724	ESE686M350AM2AA
100	18 x 36	20	460	1060	ESE107M350AN2AA
150	22 x 40	20	480	1585	ESE157M350AQ4AA

400 Vdc Rated voltage - 450 Vdc Surge voltage					
Rated cap. 120 Hz 20°C (μF)	Case size DxL (mm)	D.F. 120 Hz 25°C (tgδ %)	R.C. 120 Hz 105°C (mA <sub>rms</sub> )	L.C. 20°C 2 min. (μA)	Arcotronics P/N
0.47	6 x 11	20	14	16	ESE474M400AE3AA
1.0	6 x 11	20	16	22	ESE105M400AE3AA
1.0	8 x 11	20	20	22	ESE105M400AG3AA
2.2	8 x 11	20	28	36	ESE225M400AG3AA
2.2	10 x 12	20	35	36	ESE225M400AH1AA
3.3	8 x 11	20	38	50	ESE335M400AG3AA
3.3	10 x 12	20	50	50	ESE335M400AH1AA
4.7	10 x 12	20	49	66	ESE475M400AH1AA
4.7	10 x 15	20	57	66	ESE475M400AH2AA
6.8	10 x 19	20	72	92	ESE685M400AH4AA
10	10 x 19	20	77	130	ESE106M400AH4AA
10	13 x 20	20	97	130	ESE106M400AL3AA
15	10 x 19	20	100	190	ESE156M400AH4AA
15	13 x 25	20	150	190	ESE156M400AL4AA
22	13 x 20	20	150	274	ESE226M400AL3AA
22	13 x 25	20	175	274	ESE226M400AL4AA
33	13 x 25	20	190	406	ESE336M400AL4AA
33	16 x 25	20	230	406	ESE336M400AM7AA
47	16 x 25	20	280	574	ESE476M400AM7AA
68	18 x 25	20	300	826	ESE686M400AN5AA
68	18 x 36	20	380	826	ESE686M400AN2AA
100	18 x 36	20	480	1210	ESE107M400AN2AA

450 Vdc Rated voltage - 500 Vdc Surge voltage					
Rated cap. 120 Hz 20°C (μF)	Case size DxL (mm)	D.F. 120 Hz 25°C (tgδ %)	R.C. 120 Hz 105°C (mA <sub>rms</sub> )	L.C. 20°C 2 min. (μA)	Arcotronics P/N
0.47	6 x 11	20	14	16	ESE474M450AE3AA
1.0	8 x 11	20	20	23	ESE105M450AG3AA
2.2	10 x 12	20	35	40	ESE225M450AH1AA
3.3	10 x 15	20	54	54	ESE335M450AH2AA
4.7	10 x 15	20	60	73	ESE475M450AH2AA
6.8	10 x 19	20	80	102	ESE685M450AH4AA
10	13 x 20	20	85	145	ESE106M450AL3AA
10	13 x 25	20	100	145	ESE106M450AL4AA
15	16 x 25	20	160	212	ESE156M450AM7AA
22	16 x 25	20	150	307	ESE226M450AM7AA
22	16 x 32	20	180	307	ESE226M450AM2AA
33	16 x 25	20	190	455	ESE336M450AM7AA
33	16 x 36	20	240	455	ESE336M450AM3AA
47	16 x 36	20	300	644	ESE476M450AM3AA
47	18 x 40	20	360	644	ESE476M450AN3AA
68	22 x 40	20	400	928	ESE686M450AQ4AA

### SINGLE-ENDED LEADS - General purpose 105°C / 2000 h

#### Description

Long life for 2000 hours at 105°C, ideally suited for high quality and high reliability applications.

#### Applications

Coupling, decoupling, by-pass, filtering.

#### Features

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

#### Marking

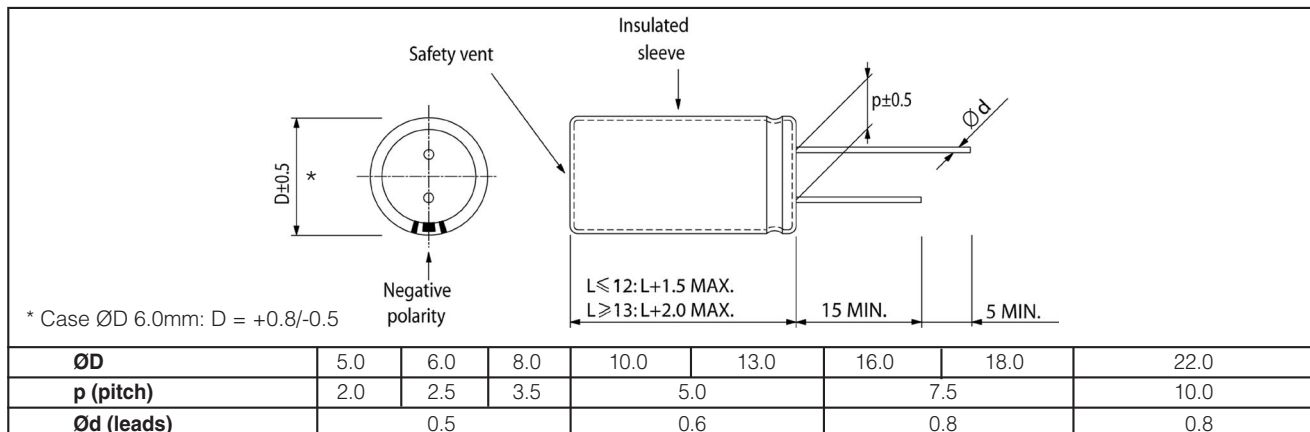
ARCOTRONICS' logo

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

Rated capacitance ( $\mu\text{F}$ ), Rated voltage: (Vdc),

Negative polarity: (white line), Date code.

Diagram of dimensions (Units=mm)



#### Electrical characteristics

Rated voltage	6.3 to 100 Vdc	160 to 450 Vdc
Operating temperature	-40 to +105°C	-25 to +105°C
Capacitance range	0.47 $\mu\text{F}$ to 15000 $\mu\text{F}$	0.47 $\mu\text{F}$ to 470 $\mu\text{F}$ .
Capacitance tolerance	$\pm 20\%$ at 120Hz / 20°C	
Endurance test	2000 hours (see conditions in Test method and performance)	
Leakage current	$I = 0.01 CV (\mu\text{A})$	$I = 0.03 CV (\mu\text{A}) + 10\mu\text{A}$
	C = rated capacitance ( $\mu\text{F}$ ); V = rated voltage (Vdc) (after that DC rated voltage at 20°C has been applied for 2 min)	

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

Rated voltage	Capacitance range	50 Hz	120 Hz	300 Hz	1 kHz	10 to 100 kHz
6.3 to 100 Vdc	0.47 to 68 $\mu\text{F}$	0.75	1.00	1.30	1.57	2.00
6.3 to 100 Vdc	100 to 470 $\mu\text{F}$	0.75	1.00	1.23	1.34	1.50
6.3 to 100 Vdc	680 to 15 000 $\mu\text{F}$	0.75	1.00	1.10	1.13	1.15
160 to 450 Vdc	0.47 to 470 $\mu\text{F}$	0.80	1.00	1.25	1.40	1.60

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

Temperature	65°C	85°C	105°C
<b>Multiplier factors</b>	1.70	1.40	1.00



### SINGLE-ENDED LEADS - General purpose 105°C / 2000 h

#### Test method and performance

Conditions	Load life test	Shelf life test
Temperature: Test duration: Ripple current:	105°C 2000 hours max ripple current at 120Hz 105°C specified in the table.	105°C 1000 hours no ripple current applied.
Voltage:	the sum of D.C. voltage and the peak A.C. voltage must not exceed the rated voltage of capacitor.	no voltage applied.
<b>Performance</b>	The following specifications will be satisfied when the capacitors are restored at 20°C	
Capacitance change: Dissipation factor: Leakage current:	within 20% of initial value. not exceed 200% of the initial requirement. not exceed initial requirement.	within 20% 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 %)	R.C. 120 Hz 105°C (mA <sub>rms</sub> )	L.C. 20°C 2 min. (μA)	Arcotronics P/N
100	5 x 11	26	100	4	ESH107M6R3AC3AA
150	5 x 11	26	120	12	ESH157M6R3AC3AA
220	6 x 11	26	165	17	ESH227M6R3AE3AA
330	6 x 11	26	200	24	ESH337M6R3AE3AA
330	8 x 11	26	200	24	ESH337M6R3AG3AA
470	8 x 11	26	280	33	ESH477M6R3AG3AA
680	10 x 12	26	320	46	ESH687M6R3AH1AA
1000	10 x 12	26	470	66	ESH108M6R3AH1AA
1500	10 x 15	26	600	97	ESH158M6R3AH2AA
2200	13 x 20	26	930	142	ESH228M6R3AL3AA
3300	13 x 20	26	1100	211	ESH338M6R3AL3AA
4700	16 x 25	26	1320	299	ESH478M6R3AM7AA
6800	16 x 25	26	1490	431	ESH688M6R3AM7AA
10000	16 x 32	26	1830	633	ESH109M6R3AM2AA
15000	16 x 36	26	2280	948	ESH159M6R3AM3AA

10 Vdc Rated voltage - 13 Vdc Surge voltage					
Rated cap. 120 Hz 20°C (μF)	Case size DxL (mm)	D.F. 120 Hz 25°C (tgδ %)	R.C. 120 Hz 105°C (mA <sub>rms</sub> )	L.C. 20°C 2 min. (μA)	Arcotronics P/N
47	5 x 11	22	75	8	ESH476M010AC3AA
68	5 x 11	22	80	10	ESH686M010AC3AA
100	5 x 11	22	110	13	ESH107M010AC3AA
150	6 x 11	22	130	18	ESH157M010AE3AA
220	6 x 11	22	180	25	ESH227M010AE3AA
330	8 x 11	22	255	36	ESH337M010AG3AA
470	8 x 11	22	305	50	ESH477M010AG3AA
680	10 x 12	22	420	71	ESH687M010AH1AA
1000	10 x 15	22	570	103	ESH108M010AH2AA
1500	10 x 19	22	750	153	ESH158M010AH4AA
2200	13 x 20	22	1010	223	ESH228M010AL3AA
3300	13 x 25	22	1220	333	ESH338M010AL4AA
4700	16 x 25	22	1410	473	ESH478M010AM7AA
6800	16 x 32	22	1610	683	ESH688M010AM2AA
10000	18 x 36	22	1980	1003	ESH109M010AN2AA

16 Vdc Rated voltage - 20 Vdc Surge voltage					
Rated cap. 120 Hz 20°C (μF)	Case size DxL (mm)	D.F. 120 Hz 25°C (tgδ %)	R.C. 120 Hz 105°C (mA <sub>rms</sub> )	L.C. 20°C 2 min. (μA)	Arcotronics P/N
33	5 x 11	18	70	8	ESH336M016AC3AA
47	5 x 11	18	85	10	ESH476M016AC3AA
68	5 x 11	18	100	14	ESH686M016AC3AA
100	6 x 11	18	135	19	ESH107M016AE3AA
150	8 x 11	18	180	27	ESH157M016AG3AA
220	8 x 11	18	235	38	ESH227M016AG3AA
330	10 x 12	18	285	56	ESH337M016AH1AA
470	10 x 12	18	395	78	ESH477M016AH1AA
680	10 x 15	18	530	112	ESH687M016AH2AA
1000	10 x 19	18	700	163	ESH108M016AH4AA
1500	13 x 20	18	860	243	ESH158M016AL3AA
2200	13 x 25	18	1150	355	ESH228M016AL4AA
3300	16 x 25	18	1350	531	ESH338M016AM7AA
4700	16 x 32	18	1560	755	ESH478M016AM2AA
6800	18 x 36	18	1790	1091	ESH688M016AN2AA

25 Vdc Rated voltage - 32 Vdc Surge voltage					
Rated cap. 120 Hz 20°C (μF)	Case size DxL (mm)	D.F. 120 Hz 25°C (tgδ %)	R.C. 120 Hz 105°C (mA <sub>rms</sub> )	L.C. 20°C 2 min. (μA)	Arcotronics P/N
22	5 x 11	16	60	8	ESH226M025AC3AA
33	5 x 11	16	75	11	ESH336M025AC3AA
47	5 x 11	16	90	15	ESH476M025AC3AA
68	6 x 11	16	125	20	ESH686M025AE3AA
100	6 x 11	16	145	28	ESH107M025AE3AA
150	8 x 11	16	200	40	ESH157M025AG3AA
220	8 x 11	16	250	58	ESH227M025AG3AA
220	10 x 12	16	250	58	ESH227M025AH1AA
330	10 x 12	16	355	85	ESH337M025AH1AA
470	10 x 12	16	405	120	ESH477M025AH1AA
470	10 x 15	16	470	120	ESH477M025AH2AA
680	10 x 19	16	650	173	ESH687M025AH4AA
1000	13 x 20	16	855	253	ESH108M025AL3AA
1500	13 x 25	16	1020	378	ESH158M025AL4AA
2200	16 x 25	16	1230	553	ESH228M025AM7AA
3300	16 x 32	16	1450	828	ESH338M025AM2AA
4700	18 x 36	16	1690	1178	ESH478M025AN2AA

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 - General purpose 105°C / 2000 h

35 Vdc Rated voltage - 44 Vdc Surge voltage					
Rated cap. 120 Hz 20°C (μF)	Case size DxL (mm)	D.F. 120 Hz 25°C (tgδ %)	R.C. 120 Hz 105°C (mA <sub>rms</sub> )	L.C. 20°C 2 min. (μA)	Arcotronics P/N
10	5 x 11	14	44	6	ESH106M035AC3AA
15	5 x 11	14	50	8	ESH156M035AC3AA
22	5 x 11	14	65	11	ESH226M035AC3AA
33	5 x 11	14	85	14	ESH336M035AC3AA
47	6 x 11	14	115	19	ESH476M035AE3AA
68	8 x 11	14	130	27	ESH686M035AG3AA
100	8 x 11	14	190	38	ESH107M035AG3AA
150	10 x 12	14	240	55	ESH157M035AH1AA
220	10 x 12	14	315	80	ESH227M035AH1AA
330	10 x 15	14	440	118	ESH337M035AH2AA
470	10 x 19	14	580	167	ESH477M035AH4AA
470	13 x 20	14	580	167	ESH477M035AL3AA
680	13 x 20	14	730	241	ESH687M035AL3AA
1000	13 x 25	14	995	353	ESH108M035AL4AA
1500	16 x 25	14	1110	528	ESH158M035AM7AA
2200	16 x 32	14	1450	773	ESH228M035AM2AA
3300	18 x 36	14	1660	1158	ESH338M035AN2AA

50 Vdc Rated voltage - 63 Vdc Surge voltage					
Rated cap. 120 Hz 20°C (μF)	Case size DxL (mm)	D.F. 120 Hz 25°C (tgδ %)	R.C. 120 Hz 105°C (mA <sub>rms</sub> )	L.C. 20°C 2 min. (μA)	Arcotronics P/N
0.47	5 x 11	12	7	3	ESH474M050AC3AA
1.0	5 x 11	12	12	3	ESH105M050AC3AA
2.2	5 x 11	12	18	4	ESH225M050AC3AA
3.3	5 x 11	12	25	5	ESH335M050AC3AA
4.7	5 x 11	12	30	5	ESH475M050AC3AA
6.8	5 x 11	12	30	6	ESH685M050AC3AA
10	5 x 11	12	50	8	ESH106M050AC3AA
15	5 x 11	12	50	10	ESH156M050AC3AA
22	5 x 11	12	75	14	ESH226M050AC3AA
33	6 x 11	12	105	19	ESH336M050AC3AA
47	8 x 11	12	125	26	ESH476M050AG3AA
68	8 x 11	12	159	37	ESH686M050AG3AA
100	10 x 12	12	210	53	ESH107M050AH1AA
150	10 x 12	12	289	78	ESH157M050AH1AA
220	10 x 15	12	400	113	ESH227M050AH2AA
330	10 x 19	12	535	168	ESH337M050AH4AA
470	13 x 20	12	730	238	ESH477M050AL3AA
680	13 x 25	12	860	343	ESH687M050AL4AA
1000	16 x 25	12	1110	503	ESH108M050AM7AA
1500	16 x 32	12	1350	753	ESH158M050AM2AA
2200	18 x 36	12	1530	1103	ESH228M050AN2AA

63 Vdc Rated voltage - 79 Vdc Surge voltage					
Rated cap. 120 Hz 20°C (μF)	Case size DxL (mm)	D.F. 120 Hz 25°C (tgδ %)	R.C. 120 Hz 105°C (mA <sub>rms</sub> )	L.C. 20°C 2 min. (μA)	Arcotronics P/N
0.47	5 x 11	10	8	3	ESH474M063AC3AA
1.0	5 x 11	10	12	4	ESH105M063AC3AA
2.2	5 x 11	10	20	4	ESH225M063AC3AA
3.3	5 x 11	10	27	5	ESH335M063AC3AA
4.7	5 x 11	10	34	6	ESH475M063AC3AA
6.8	5 x 11	10	37	7	ESH685M063AC3AA
10	5 x 11	10	55	9	ESH106M063AC3AA
15	5 x 11	10	65	12	ESH156M063AC3AA
22	6 x 11	10	90	17	ESH226M063AE3AA
33	8 x 11	10	110	24	ESH336M063AG3AA
47	8 x 11	10	155	33	ESH476M063AG3AA
68	10 x 12	10	198	46	ESH686M063AH1AA
100	10 x 12	10	260	66	ESH107M063AH1AA
150	10 x 15	10	330	97	ESH157M063AH2AA
220	10 x 19	10	465	142	ESH227M063AH4AA
330	13 x 20	10	650	211	ESH337M063AL3AA
470	13 x 25	10	800	299	ESH477M063AL4AA
680	16 x 25	10	1000	431	ESH687M063AM7AA
1000	16 x 32	10	1200	633	ESH108M063AM2AA
1500	16 x 36	10	1450	948	ESH158M063AM3AA

100 Vdc Rated voltage - 125 Vdc Surge voltage					
Rated cap. 120 Hz 20°C (μF)	Case size DxL (mm)	D.F. 120 Hz 25°C (tgδ %)	R.C. 120 Hz 105°C (mA <sub>rms</sub> )	L.C. 20°C 2 min. (μA)	Arcotronics P/N
0.47	5 x 11	10	10	3	ESH474M100AC3AA
1.0	5 x 11	10	15	4	ESH105M100AC3AA
2.2	5 x 11	10	22	5	ESH225M100AC3AA
3.3	5 x 11	10	29	6	ESH335M100AC3AA
4.7	5 x 11	10	37	8	ESH475M100AC3AA
6.8	5 x 11	10	46	10	ESH685M100AC3AA
10	6 x 11	10	65	13	ESH106M100AE3AA
15	8 x 11	10	82	18	ESH156M100AG3AA
22	8 x 11	10	115	25	ESH226M100AG3AA
33	10 x 12	10	160	36	ESH336M100AH1AA
47	10 x 15	10	210	50	ESH476M100AH2AA
68	10 x 19	10	241	71	ESH686M100AH4AA
100	13 x 20	10	385	103	ESH107M100AL3AA
150	13 x 25	10	414	153	ESH157M100AL4AA
220	16 x 25	10	590	223	ESH227M100AM7AA
330	16 x 25	10	720	333	ESH337M100AM7AA
470	16 x 32	10	875	473	ESH477M100AM2AA
680	16 x 36	10	1200	683	ESH687M100AM3AA

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 - General purpose 105°C / 2000 h

160 Vdc Rated voltage - 200 Vdc Surge voltage					
Rated cap. 120 Hz 20°C (μF)	Case size DxL (mm)	D.F. 120 Hz 25°C (tgδ %)	R.C. 120 Hz 105°C (mA <sub>rms</sub> )	L.C. 20°C 2 min. (μA)	Arcotronics P/N
0.47	5 x 11	15	12	12	ESH474M160AC3AA
1.0	5 x 11	15	17	15	ESH105M160AC3AA
2.2	6 x 11	15	25	20	ESH225M160AE3AA
3.3	8 x 11	15	36	26	ESH335M160AG3AA
4.7	8 x 11	15	43	32	ESH475M160AG3AA
6.8	10 x 12	15	54	43	ESH685M160AH1AA
10	10 x 12	15	70	58	ESH106M160AH1AA
15	10 x 15	15	90	82	ESH156M160AH2AA
22	10 x 19	15	130	116	ESH226M160AH4AA
33	13 x 20	15	180	168	ESH336M160AL3AA
47	13 x 25	15	250	236	ESH476M160AL4AA
68	13 x 25	15	270	336	ESH686M160AL4AA
100	16 x 25	15	390	490	ESH107M160AM7AA
150	16 x 32	15	435	730	ESH157M160AM2AA
220	16 x 36	15	700	1066	ESH227M160AM3AA
330	18 x 40	15	850	1594	ESH337M160AN3AA
470	22 x 40	15	980	2266	ESH477M160AQ4AA

200 Vdc Rated voltage - 250 Vdc Surge voltage					
Rated cap. 120 Hz 20°C (μF)	Case size DxL (mm)	D.F. 120 Hz 25°C (tgδ %)	R.C. 120 Hz 105°C (mA <sub>rms</sub> )	L.C. 20°C 2 min. (μA)	Arcotronics P/N
0.47	5 x 11	15	12	13	ESH474M200AC3AA
1.0	6 x 11	15	17	16	ESH105M200AE3AA
2.2	6 x 11	15	25	23	ESH225M200AE3AA
3.3	8 x 11	15	36	30	ESH335M200AG3AA
4.7	10 x 12	15	50	38	ESH475M200AH1AA
6.8	10 x 12	15	60	51	ESH685M200AH1AA
10	10 x 15	15	80	70	ESH106M200AH2AA
15	10 x 19	15	110	100	ESH156M200AH4AA
22	10 x 19	15	140	142	ESH226M200AH4AA
33	13 x 20	15	190	208	ESH336M200AL3AA
33	13 x 25	15	190	208	ESH336M200AL4AA
47	13 x 20	15	260	292	ESH476M200AL3AA
47	13 x 25	15	260	292	ESH476M200AL4AA
68	16 x 25	15	280	418	ESH686M200AM7AA
100	16 x 32	15	400	610	ESH107M200AM2AA
150	16 x 36	15	450	910	ESH157M200AM3AA
220	18 x 36	15	750	1330	ESH227M200AN2AA
220	18 x 40	15	750	1330	ESH227M200AN3AA
330	18 x 40	15	920	1990	ESH337M200AN3AA
330	22 x 40	15	920	1990	ESH337M200AQ4AA

250 Vdc Rated voltage - 300 Vdc Surge voltage					
Rated cap. 120 Hz 20°C (μF)	Case size DxL (mm)	D.F. 120 Hz 25°C (tgδ %)	R.C. 120 Hz 105°C (mA <sub>rms</sub> )	L.C. 20°C 2 min. (μA)	Arcotronics P/N
0.47	5 x 11	15	12	13	ESH474M250AC3AA
1.0	6 x 11	15	17	17	ESH105M250AE3AA
2.2	8 x 11	15	29	26	ESH225M250AG3AA
3.3	10 x 12	15	42	35	ESH335M250AH1AA
4.7	10 x 12	15	52	45	ESH475M250AH1AA
6.8	10 x 12	15	62	61	ESH685M250AH1AA
10	10 x 15	15	75	85	ESH106M250AH2AA
10	10 x 19	15	88	85	ESH106M250AH4AA
15	13 x 20	15	120	122	ESH156M250AL3AA
22	13 x 20	15	155	175	ESH226M250AL3AA
22	13 x 25	15	155	175	ESH226M250AL4AA
33	13 x 25	15	200	257	ESH336M250AL4AA
47	16 x 25	15	270	362	ESH476M250AM7AA
68	16 x 32	15	300	520	ESH686M250AM2AA
100	18 x 36	15	440	760	ESH107M250AN2AA
150	18 x 40	15	600	1135	ESH157M250AN3AA
220	22 x 40	15	800	1660	ESH227M250AQ4AA

350 Vdc Rated voltage - 400 Vdc Surge voltage					
Rated cap. 120 Hz 20°C (μF)	Case size DxL (mm)	D.F. 120 Hz 25°C (tgδ %)	R.C. 120 Hz 105°C (mA <sub>rms</sub> )	L.C. 20°C 2 min. (μA)	Arcotronics P/N
0.47	6 x 11	20	14	15	ESH474M350AE3AA
1.0	8 x 11	20	20	20	ESH105M350AG3AA
2.2	10 x 12	20	35	33	ESH225M350AH1AA
3.3	10 x 15	20	47	45	ESH335M350AH2AA
4.7	10 x 15	20	55	59	ESH475M350AH2AA
6.8	10 x 19	20	65	81	ESH685M350AH4AA
10	13 x 20	20	95	115	ESH106M350AL3AA
15	13 x 20	20	140	167	ESH156M350AL3AA
22	16 x 25	20	165	241	ESH226M350AM7AA
33	16 x 32	20	195	356	ESH336M350AM2AA
47	16 x 36	20	210	503	ESH476M350AM3AA
47	18 x 36	20	240	503	ESH476M350AN2AA
68	18 x 36	20	320	724	ESH686M350AN2AA
100	18 x 40	20	300	1060	ESH107M350AN3AA
100	22 x 40	20	360	1060	ESH107M350AQ4AA
150	22 x 40	20	480	1585	ESH157M350AQ4AA

400 Vdc Rated voltage - 450 Vdc Surge voltage					
Rated cap. 120 Hz 20°C (μF)	Case size DxL (mm)	D.F. 120 Hz 25°C (tgδ %)	R.C. 120 Hz 105°C (mA <sub>rms</sub> )	L.C. 20°C 2 min. (μA)	Arcotronics P/N
0.47	6 x 11	20	14	16	ESH474M400AE3AA
1.0	8 x 11	20	20	22	ESH105M400AG3AA
2.2	10 x 12	20	35	36	ESH225M400AH1AA
3.3	10 x 12	20	42	50	ESH335M400AH1AA
3.3	10 x 15	20	49	50	ESH335M400AH2AA
4.7	10 x 15	20	57	66	ESH475M400AH2AA
6.8	10 x 19	20	67	92	ESH685M400AH4AA
10	10 x 19	20	75	130	ESH106M400AH4AA
10	13 x 20	20	97	130	ESH106M400AL3AA
15	13 x 25	20	145	190	ESH156M400AL4AA
22	13 x 25	20	140	274	ESH226M400AL4AA
22	16 x 25	20	170	274	ESH226M400AM7AA
33	16 x 25	20	190	406	ESH336M400AM7AA
33	16 x 32	20	230	406	ESH336M400AM2AA
47	16 x 32	20	250	574	ESH476M400AM2AA
47	18 x 36	20	300	574	ESH476M400AN2AA
68	18 x 36	20	325	826	ESH686M400AN2AA
100	18 x 36	20	290	1210	ESH107M400AN2AA
100	22 x 40	20	365	1210	ESH107M400AQ4AA
150	22 x 40	20	465	1810	ESH157M400AQ4AA

450 Vdc Rated voltage - 500 Vdc Surge voltage					
Rated cap. 120 Hz 20°C (μF)	Case size DxL (mm)	D.F. 120 Hz 25°C (tgδ %)	R.C. 120 Hz 105°C (mA <sub>rms</sub> )	L.C. 20°C 2 min. (μA)	Arcotronics P/N
0.47	6 x 11	20	16	16	ESH474M450AE3AA
1.0	8 x 11	20	22	23	ESH105M450AG3AA
2.2	10 x 12	20	37	40	ESH225M450AH1AA
3.3	10 x 15	20	51	54	ESH335M450AH2AA
4.7	10 x 15	20	59	73	ESH475M450AH2AA
6.8	13 x 20	20	69	102	ESH685M450AL3AA
10	13 x 25	20	99	145	ESH106M450AL4AA
15	16 x 25	20	150	212	ESH156M450AM7AA
22	16 x 25	20	145	307	ESH226M450AM7AA
22	16 x 32	20	175	307	ESH226M450AM2AA
33	18 x 36	20	250	455	ESH336M450AN2AA
47	18 x 40	20	350	644	ESH476M450AN3AA
68	22 x 40	20	380	928	ESH686M450AQ4AA

### SINGLE-ENDED LEADS - Low Impedance 105°C / 2000 to 3000 h

#### Description

Capacitors for high frequency applications.

#### Applications

High frequency switching mode circuits.

#### Features

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

#### Marking

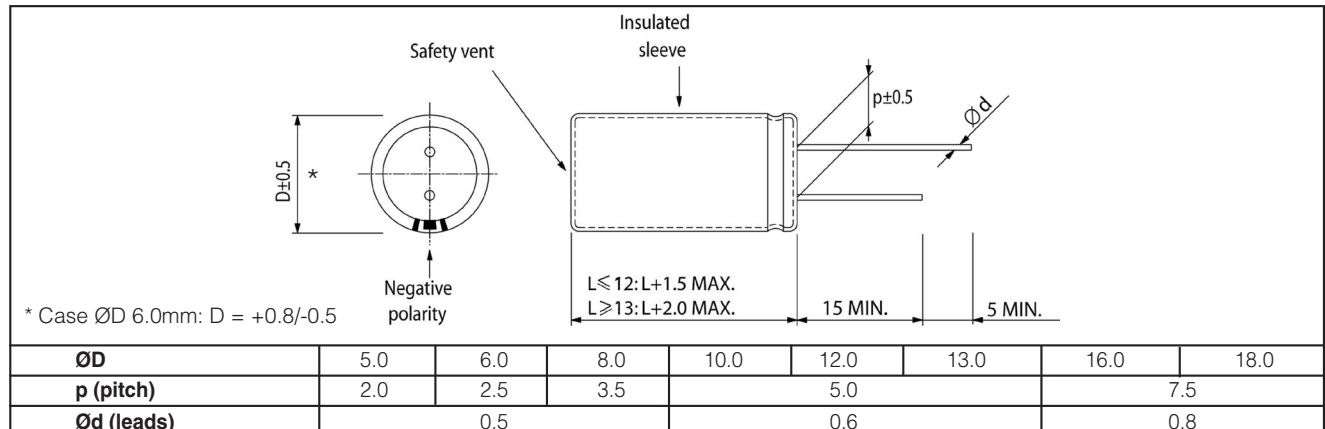
ARCOTRONICS' logo

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

Rated capacitance ( $\mu\text{F}$ ), 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	1.0 $\mu\text{F}$ to 15000 $\mu\text{F}$
Capacitance tolerance	$\pm 20\%$ at 120Hz / 20°C
Endurance test	2000 to 3000 h (see conditions in Test method and performance)
Leakage current	$I = 0.01 CV (\mu\text{A})$ or $3\mu\text{A}$ whichever is greater C = rated capacitance ( $\mu\text{F}$ ); 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

<b>Rated voltage (Vdc)</b>	<b>6.3</b>	<b>10</b>	<b>16</b>	<b>25</b>	<b>35</b>	<b>50</b>	<b>63</b>	<b>100</b>
Z (-40°C) / Z (20°C)	10	8	5	4	4	4	4	4

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

<b>Capacitance range</b>	<b>50 Hz</b>	<b>120 Hz</b>	<b>300 Hz</b>	<b>1 kHz</b>	<b>10 kHz</b>	<b>100 kHz</b>
1.0 to 4.7 $\mu\text{F}$	0.30	0.40	0.50	0.70	0.80	1.00
5.6 to 33 $\mu\text{F}$	0.40	0.50	0.60	0.80	0.90	1.00
47 to 330 $\mu\text{F}$	0.60	0.70	0.80	0.90	0.95	1.00
470 to 1000 $\mu\text{F}$	0.65	0.80	0.90	0.98	1.00	1.00
1200 to 15000 $\mu\text{F}$	0.85	0.90	0.95	0.98	1.00	1.00

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

<b>Temperature</b>	<b>65°C</b>	<b>85°C</b>	<b>105°C</b>
<b>Multiplier factors</b>	1.90	1.60	1.00

### SINGLE-ENDED LEADS - Low Impedance 105°C / 2000 to 3000 h

#### Test method and performance

Conditions	Load life test	Shelf life test
Temperature: Test duration: Ripple current: Voltage:	105°C Ø D 5x11 to 10x12 mm: 2000 h Ø D ≥10x15 mm: 3000 h max ripple current at 100KHz 105°C specified in the table. the sum of D.C. voltage and the peak A.C. voltage must not exceed the rated voltage of capacitor.	105°C 1000 hours no ripple current applied. no voltage applied.
<b>Performance</b>	The following specifications will be satisfied when the capacitors are restored at 20°C	
Capacitance change: Dissipation factor: Leakage current:	within 20% of initial value. not exceed 200% of the initial requirement. not exceed initial requirement.	within 20% of initial value. not exceed 200% of the initial requirement. not exceed initial requirement.

#### Technical data and ordering codes

Rated cap. 120 Hz 20°C (µF)	Case size DxL (mm)	6.3 Vdc Rated voltage - 8 Vdc Surge voltage				L.C. 20°C 2 min. (µA)	Arcotronics P/N
		D.F. 120 Hz 25°C (tgδ %)	Z 100 kHz 25°C (Ω)	R.C. 100kHz 105°C (mA <sub>rms</sub> )			
150	5 x 11	15	0.420	200	9	ESC157M6R3AC3AA	
220	6 x 11	15	0.320	250	14	ESC227M6R3AE3AA	
330	8 x 11	15	0.180	400	21	ESC337M6R3AG3AA	
470	8 x 11	15	0.140	550	30	ESC477M6R3AG3AA	
680	8 x 15	15	0.100	700	43	ESC687M6R3AG4AA	
820	8 x 20	15	0.085	750	52	ESC827M6R3AG6AA	
1000	8 x 20	15	0.069	800	63	ESC108M6R3AG6AA	
1200	10 x 15	15	0.064	1000	76	ESC128M6R3AH2AA	
1500	10 x 19	15	0.044	1250	94	ESC158M6R3AH4AA	
2200	13 x 20	15	0.043	1450	139	ESC228M6R3AL3AA	
3300	13 x 25	15	0.035	1700	208	ESC338M6R3AL4AA	
4700	16 x 25	15	0.028	1800	296	ESC478M6R3AM7AA	
6800	16 x 32	15	0.024	2000	428	ESC688M6R3AM2AA	
8200	16 x 32	15	0.019	2350	517	ESC828M6R3AM2AA	
10000	16 x 36	15	0.019	2550	630	ESC109M6R3AM3AA	
15000	18 x 36	15	0.019	3000	945	ESC159M6R3AN2AA	

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 - Low Impedance 105°C / 2000 to 3000 h

Rated cap. 120 Hz 20°C ( $\mu\text{F}$ )	Case size DxL (mm)	10 Vdc Rated voltage - 13 Vdc Surge voltage			L.C. 20°C 2 min. ( $\mu\text{A}$ )	Arcotronics P/N
		D.F. 120 Hz 25°C ( $\text{tg}\delta$ %)	Z 100 kHz 25°C ( $\Omega$ )	R.C. 100kHz 105°C ( $\text{mA}_{\text{rms}}$ )		
100	5 x 11	14	0.420	150	10	ESC107M010AC3AA
120	5 x 11	14	0.370	200	12	ESC127M010AC3AA
150	6 x 11	14	0.320	250	15	ESC157M010AE3AA
220	6 x 11	14	0.220	300	22	ESC227M010AE3AA
330	8 x 11	14	0.140	550	33	ESC337M010AG3AA
470	8 x 15	14	0.100	750	47	ESC477M010AG4AA
470	10 x 12	14	0.120	630	47	ESC477M010AH1AA
680	10 x 12	14	0.085	800	68	ESC687M010AH1AA
820	10 x 15	14	0.064	1050	82	ESC827M010AH2AA
1000	8 x 20	14	0.065	1080	100	ESC108M010AG6AA
1200	10 x 19	14	0.044	1250	120	ESC128M010AH4AA
1500	10 x 19	14	0.039	1450	150	ESC158M010AH4AA
2200	13 x 20	14	0.038	1600	220	ESC228M010AL3AA
3300	13 x 25	14	0.028	2000	330	ESC338M010AL4AA
4700	16 x 25	14	0.024	2200	470	ESC478M010AM7AA
6800	16 x 36	14	0.019	2550	680	ESC688M010AM3AA
8200	18 x 36	14	0.019	2800	820	ESC828M010AN2AA

Rated cap. 120 Hz 20°C ( $\mu\text{F}$ )	Case size DxL (mm)	16 Vdc Rated voltage - 20 Vdc Surge voltage			L.C. 20°C 2 min. ( $\mu\text{A}$ )	Arcotronics P/N
		D.F. 120 Hz 25°C ( $\text{tg}\delta$ %)	Z 100 kHz 25°C ( $\Omega$ )	R.C. 100kHz 105°C ( $\text{mA}_{\text{rms}}$ )		
68	5 x 11	12	0.420	150	11	ESC686M016AC3AA
100	5 x 11	12	0.370	200	16	ESC107M016AC3AA
120	6 x 11	12	0.320	250	19	ESC127M016AE3AA
150	6 x 11	12	0.220	300	24	ESC157M016AE3AA
220	8 x 11	12	0.140	550	35	ESC227M016AG3AA
330	8 x 15	12	0.100	750	53	ESC337M016AG4AA
470	10 x 12	12	0.085	800	75	ESC477M016AH1AA
680	10 x 15	12	0.064	1050	109	ESC687M016AH2AA
820	10 x 19	12	0.044	1100	131	ESC827M016AH4AA
1000	10 x 19	12	0.039	1250	160	ESC108M016AH4AA
1200	13 x 20	12	0.038	1450	192	ESC128M016AL3AA
1500	13 x 20	12	0.034	1600	240	ESC158M016AL3AA
2200	13 x 25	12	0.028	2000	352	ESC228M016AL4AA
3300	16 x 25	12	0.024	2200	528	ESC338M016AM7AA
4700	16 x 36	12	0.019	2550	752	ESC478M016AM3AA
6800	18 x 36	12	0.019	2800	1088	ESC688M016AN2AA

For capacitor whose capacitance exceeds 1000  $\mu\text{F}$  the value of D.F. (%) is increased by 2% for every addition of 1000  $\mu\text{F}$

### SINGLE-ENDED LEADS - Low Impedance 105°C / 2000 to 3000 h

Rated cap. 120 Hz 20°C ( $\mu\text{F}$ )	Case size DxL (mm)	25 Vdc Rated voltage - 32 Vdc Surge voltage			L.C. 20°C 2 min. ( $\mu\text{A}$ )	Arcotronics P/N
		D.F. 120 Hz 25°C ( $\text{tg}\delta$ %)	Z 100 kHz 25°C ( $\Omega$ )	R.C. 100kHz 105°C ( $\text{mA}_{\text{rms}}$ )		
47	5 x 11	10	0.420	150	12	ESC476M025AC3AA
68	6 x 11	10	0.370	200	17	ESC686M025AE3AA
100	6 x 11	10	0.220	250	25	ESC107M025AE3AA
120	8 x 11	10	0.200	300	30	ESC127M025AG3AA
150	8 x 11	10	0.140	550	37	ESC157M025AG3AA
220	8 x 15	10	0.100	750	55	ESC227M025AG4AA
330	8 x 20	10	0.069	800	82	ESC337M025AG6AA
470	10 x 15	10	0.064	1050	117	ESC477M025AH2AA
680	10 x 19	10	0.039	1100	170	ESC687M025AH4AA
820	10 x 19	10	0.039	1250	205	ESC827M025AH4AA
1000	13 x 20	10	0.038	1450	250	ESC108M025AL3AA
1200	13 x 25	10	0.029	1600	300	ESC128M025AL4AA
1500	16 x 25	10	0.028	2000	375	ESC158M025AM7AA
2200	16 x 32	10	0.024	2200	550	ESC228M025AM2AA
3300	16 x 36	10	0.019	2550	825	ESC338M025AM3AA
4700	18 x 36	10	0.019	2800	1175	ESC478M025AN2AA

Rated cap. 120 Hz 20°C ( $\mu\text{F}$ )	Case size DxL (mm)	35 Vdc Rated voltage - 44 Vdc Surge voltage			L.C. 20°C 2 min. ( $\mu\text{A}$ )	Arcotronics P/N
		D.F. 120 Hz 25°C ( $\text{tg}\delta$ %)	Z 100 kHz 25°C ( $\Omega$ )	R.C. 100kHz 105°C ( $\text{mA}_{\text{rms}}$ )		
4.7	5 x 11	10	1.200	115	3	ESC475M035AC3AA
6.8	5 x 11	10	1.000	120	3	ESC685M035AC3AA
10	5 x 11	10	0.900	140	3	ESC106M035AC3AA
15	5 x 11	10	0.690	170	5	ESC156M035AC3AA
22	5 x 11	10	0.420	190	8	ESC226M035AC3AA
33	5 x 11	10	0.420	200	11	ESC336M035AC3AA
47	6 x 11	10	0.370	250	16	ESC476M035AE3AA
68	6 x 11	10	0.220	300	24	ESC686M035AE3AA
100	8 x 11	10	0.140	450	35	ESC107M035AG3AA
120	8 x 11	10	0.130	550	42	ESC127M035AG3AA
150	8 x 15	10	0.100	650	52	ESC157M035AG4AA
220	8 x 20	10	0.085	780	77	ESC227M035AG6AA
220	10 x 12	10	0.069	800	77	ESC227M035AH1AA
330	10 x 19	10	0.044	1050	115	ESC337M035AH4AA
470	10 x 19	10	0.039	1300	164	ESC477M035AH4AA
680	13 x 20	10	0.038	1400	238	ESC687M035AL3AA
820	13 x 20	10	0.034	1550	287	ESC827M035AL3AA
1000	13 x 25	10	0.029	1700	350	ESC108M035AL4AA
1200	16 x 25	10	0.028	1900	420	ESC128M035AM7AA
1500	16 x 25	10	0.024	2100	525	ESC158M035AM7AA
2200	16 x 32	10	0.021	2500	770	ESC228M035AM2AA
2200	16 x 36	10	0.019	2550	770	ESC228M035AM3AA
3300	18 x 36	10	0.019	2800	1155	ESC338M035AN2AA

For capacitor whose capacitance exceeds 1000  $\mu\text{F}$  the value of D.F. (%) is increased by 2% for every addition of 1000  $\mu\text{F}$

### SINGLE-ENDED LEADS - Low Impedance 105°C / 2000 to 3000 h

Rated cap. 120 Hz 20°C ( $\mu\text{F}$ )	Case size DxL (mm)	50 Vdc Rated voltage - 63 Vdc Surge voltage				L.C. 20°C 2 min. ( $\mu\text{A}$ )	Arcotronics P/N
		D.F. 120 Hz 25°C (tg $\delta$ %)	Z 100 kHz 25°C ( $\Omega$ )	R.C. 100kHz 105°C (mA <sub>rms</sub> )			
1.0	5 x 11	8	2.400	40	3	ESC105M050AC3AA	
4.7	5 x 11	8	2.000	115	3	ESC475M050AC3AA	
6.8	5 x 11	8	1.850	120	3	ESC685M050AC3AA	
10	5 x 11	8	1.700	140	5	ESC106M050AC3AA	
15	5 x 11	8	1.200	180	7	ESC156M050AC3AA	
22	5 x 11	8	0.700	200	11	ESC226M050AC3AA	
33	6 x 11	8	0.600	250	16	ESC336M050AE3AA	
47	6 x 11	8	0.520	300	23	ESC476M050AE3AA	
68	8 x 11	8	0.350	450	34	ESC686M050AG3AA	
100	8 x 15	8	0.250	550	50	ESC107M050AG4AA	
120	8 x 20	8	0.210	650	60	ESC127M050AG6AA	
150	10 x 12	8	0.160	800	75	ESC157M050AH1AA	
220	10 x 15	8	0.100	1050	110	ESC227M050AH2AA	
330	10 x 19	8	0.072	1300	165	ESC337M050AH4AA	
470	13 x 20	8	0.060	1400	235	ESC477M050AL3AA	
680	13 x 25	8	0.050	1550	340	ESC687M050AL4AA	
820	16 x 25	8	0.040	1700	410	ESC827M050AM7AA	
1000	16 x 25	8	0.039	1900	500	ESC108M050AM7AA	
1200	16 x 32	8	0.025	2100	600	ESC128M050AM2AA	
1500	16 x 36	8	0.025	2550	750	ESC158M050AM3AA	
2200	18 x 40	8	0.025	2800	1100	ESC228M050AN3AA	

Rated cap. 120 Hz 20°C ( $\mu\text{F}$ )	Case size DxL (mm)	63 Vdc Rated voltage - 79 Vdc Surge voltage				L.C. 20°C 2 min. ( $\mu\text{A}$ )	Arcotronics P/N
		D.F. 120 Hz 25°C (tg $\delta$ %)	Z 100 kHz 25°C ( $\Omega$ )	R.C. 100kHz 105°C (mA <sub>rms</sub> )			
4.7	5 x 11	8	2.200	115	3	ESC475M063AC3AA	
6.8	5 x 11	8	2.000	120	4	ESC685M063AC3AA	
10	5 x 11	8	1.850	140	6	ESC106M063AC3AA	
15	5 x 11	8	1.700	200	9	ESC156M063AC3AA	
22	6 x 11	8	1.200	250	14	ESC226M063AE3AA	
33	6 x 11	8	0.900	300	21	ESC336M063AE3AA	
47	8 x 11	8	0.700	450	30	ESC476M063AG3AA	
68	8 x 11	8	0.520	550	43	ESC686M063AG3AA	
100	8 x 20	8	0.350	650	63	ESC107M063AG6AA	
120	10 x 15	8	0.300	800	76	ESC127M063AH2AA	
150	10 x 15	8	0.200	1050	94	ESC157M063AH2AA	
220	10 x 19	8	0.150	1300	139	ESC227M063AH4AA	
330	13 x 20	8	0.100	1400	208	ESC337M063AL3AA	
470	13 x 25	8	0.064	1550	296	ESC477M063AL4AA	
680	16 x 25	8	0.052	1700	428	ESC687M063AM7AA	
820	16 x 32	8	0.048	1900	517	ESC827M063AM2AA	
1000	16 x 32	8	0.042	2100	630	ESC108M063AM2AA	
1200	16 x 36	8	0.036	2550	756	ESC128M063AM3AA	
1500	18 x 36	8	0.033	2800	945	ESC158M063AN2AA	

For capacitor whose capacitance exceeds 1000  $\mu\text{F}$  the value of D.F. (%) is increased by 2% for every addition of 1000  $\mu\text{F}$

### SINGLE-ENDED LEADS - Low Impedance 105°C / 2000 to 3000 h

Rated cap. 120 Hz 20°C ( $\mu\text{F}$ )	Case size DxL (mm)	100 Vdc Rated voltage - 125 Vdc Surge voltage			L.C. 20°C 2 min. ( $\mu\text{A}$ )	Arcotronics P/N
		D.F. 120 Hz 25°C ( $\text{tg}\delta$ %)	Z 100 kHz 25°C ( $\Omega$ )	R.C. 100kHz 105°C ( $\text{mA}_{\text{rms}}$ )		
4.7	5 x 11	7	2.000	120	5	ESC475M100AC3AA
6.8	5 x 11	7	1.850	140	7	ESC685M100AC3AA
10	6 x 11	7	1.500	200	10	ESC106M100AE3AA
15	6 x 11	7	1.200	250	15	ESC156M100AE3AA
22	8 x 11	7	0.790	300	22	ESC226M100AG3AA
33	8 x 15	7	0.590	450	33	ESC336M100AG4AA
47	10 x 15	7	0.350	550	47	ESC476M100AH2AA
68	10 x 19	7	0.240	650	68	ESC686M100AH4AA
100	13 x 20	7	0.180	800	100	ESC107M100AL3AA
120	13 x 25	7	0.150	1050	120	ESC127M100AL4AA
150	13 x 25	7	0.110	1300	150	ESC157M100AL4AA
220	16 x 25	7	0.071	1400	220	ESC227M100AM7AA
330	16 x 32	7	0.049	1550	330	ESC337M100AM2AA
470	18 x 36	7	0.038	1700	470	ESC477M100AN2AA



### SINGLE-ENDED LEADS - Low Impedance 105°C / 2000 to 5000 h

#### Description

Capacitors for high frequency applications.

#### Applications

High frequency switching mode circuits.

#### Features

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

#### Marking

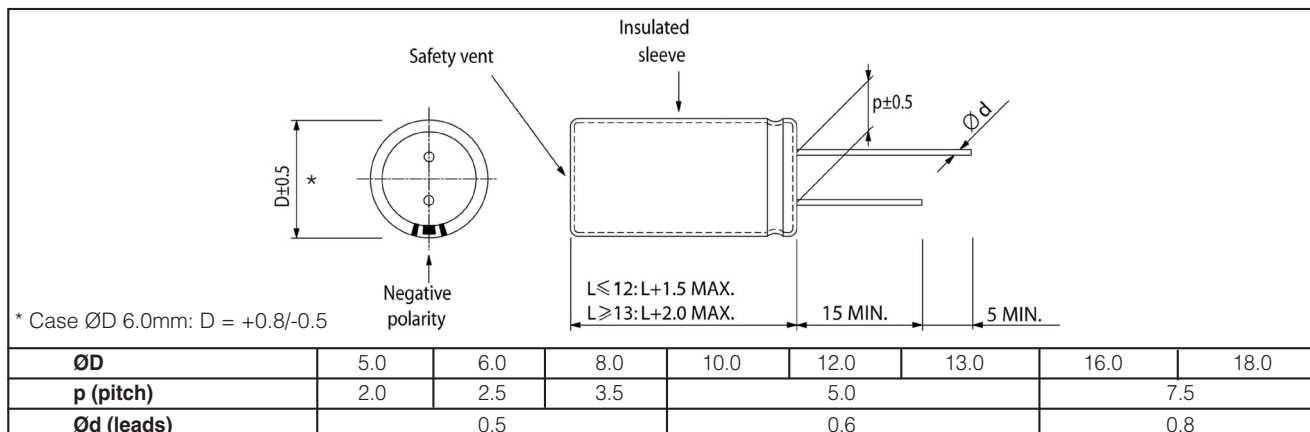
ARCOTRONICS' logo

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

Rated capacitance ( $\mu\text{F}$ ), Rated voltage: (Vdc),

Negative polarity: (black 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	4.7 $\mu\text{F}$ to 15000 $\mu\text{F}$
Capacitance tolerance	$\pm 20\%$ at 120Hz / 20°C
Endurance test	2000 to 5000 h (see conditions in Test method and performance)
Leakage current	$I = 0.01 CV$ ( $\mu\text{A}$ ) or $3\mu\text{A}$ whichever is greater C = rated capacitance ( $\mu\text{F}$ ); 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	80	100
Z (-40°C) / Z (20°C)	10	6	5	4	4	4	4	4	4

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

Capacitance range	50 Hz	120 Hz	300 Hz	1 kHz	10 kHz	100 kHz
4.7 $\mu\text{F}$	0.30	0.40	0.50	0.70	0.80	1.00
6.8 to 33 $\mu\text{F}$	0.40	0.50	0.60	0.80	0.90	1.00
47 to 330 $\mu\text{F}$	0.60	0.70	0.80	0.90	0.95	1.00
470 to 1000 $\mu\text{F}$	0.65	0.80	0.90	0.98	1.00	1.00
1200 to 15000 $\mu\text{F}$	0.85	0.90	0.95	0.98	1.00	1.00

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

Temperature	65°C	85°C	105°C
Multiplier factors	1.80	1.50	1.00

### SINGLE-ENDED LEADS - Low Impedance 105°C / 2000 to 5000 h

#### Test method and performance

Conditions	Load life test	Shelf life test
Temperature: Test duration:  Ripple current: Voltage:	105°C Ø D ≤8.0 mm: 2000 h Ø D 10.0 mm: 3000 h Ø D ≥12.0 mm: 5000 h 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.	105°C 1000 hours  no ripple current applied. no voltage applied.
<b>Performance</b>	The following specifications will be satisfied when the capacitors are restored at 20°C.	
Capacitance change: Dissipation factor: Leakage current:	within 20% of initial value. not exceed 200% of the initial requirement. not exceed initial requirement.	within 20% of initial value. not exceed 200% of the initial requirement. not exceed initial requirement.

#### Technical data and ordering codes

Rated cap. 120 Hz 20°C (µF)	Case size DxL (mm)	6.3 Vdc Rated voltage - 8 Vdc Surge voltage			L.C. 20°C 2 min. (µA)	Arcotronics P/N
		D.F. 120 Hz 25°C (tgδ %)	Z 100 kHz 25°C (Ω)	R.C. 100kHz 105°C (mA <sub>rms</sub> )		
100	5 x 11	19	1.500	166	6	ESX107M6R3AC3AA
120	5 x 11	19	1.300	175	7	ESX127M6R3AC3AA
150	6 x 11	19	0.920	225	9	ESX157M6R3AE3AA
220	8 x 11	19	0.610	285	14	ESX227M6R3AG3AA
330	8 x 11	19	0.400	410	21	ESX337M6R3AG3AA
470	10 x 12	19	0.280	550	30	ESX477M6R3AH1AA
680	10 x 15	19	0.220	735	43	ESX687M6R3AH2AA
820	10 x 15	19	0.190	795	52	ESX827M6R3AH2AA
1000	10 x 19	19	0.170	950	63	ESX108M6R3AH4AA
1200	10 x 19	19	0.140	1020	76	ESX128M6R3AH4AA
1500	10 x 19	19	0.140	1000	94	ESX158M6R3AH4AA
1500	10 x 25	19	0.120	1200	94	ESX158M6R3AH5AA
2200	10 x 30	19	0.095	1450	139	ESX228M6R3AH6AA
3300	12 x 35	19	0.081	1700	208	ESX338M6R3AK3AA
4700	12 x 35	19	0.063	2110	296	ESX478M6R3AK3AA
6800	16 x 32	19	0.055	2350	428	ESX688M6R3AM2AA
8200	16 x 36	19	0.047	2550	517	ESX828M6R3AM3AA
10000	16 x 40	19	0.039	2750	630	ESX109M6R3AM4AA
15000	18 x 40	19	0.037	2950	945	ESX159M6R3AN3AA

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 - Low Impedance 105°C / 2000 to 5000 h

Rated cap. 120 Hz 20°C ( $\mu\text{F}$ )	Case size DxL (mm)	10 Vdc Rated voltage - 13 Vdc Surge voltage			L.C. 20°C 2 min. ( $\mu\text{A}$ )	Arcotronics P/N
		D.F. 120 Hz 25°C ( $\text{tg}\delta$ %)	Z 100 kHz 25°C ( $\Omega$ )	R.C. 100kHz 105°C ( $\text{mA}_{\text{rms}}$ )		
22	5 x 11	16	5.400	44	3	ESX226M010AC3AA
33	5 x 11	16	3.300	66	3	ESX336M010AC3AA
47	5 x 11	16	2.200	94	5	ESX476M010AC3AA
68	5 x 11	16	1.300	136	7	ESX686M010AC3AA
100	5 x 11	16	1.150	170	10	ESX107M010AC3AA
100	6 x 11	16	1.000	200	10	ESX107M010AE3AA
120	6 x 11	16	0.910	240	12	ESX127M010AE3AA
150	6 x 11	16	0.700	265	15	ESX157M010AE3AA
220	6 x 11	16	0.590	290	22	ESX227M010AE3AA
220	8 x 11	16	0.480	370	22	ESX227M010AG3AA
330	8 x 11	16	0.330	470	33	ESX337M010AG3AA
470	8 x 11	16	0.300	480	47	ESX477M010AG3AA
470	10 x 12	16	0.240	590	47	ESX477M010AH1AA
680	8 x 20	16	0.180	790	68	ESX687M010AG6AA
680	10 x 15	16	0.180	790	68	ESX687M010AH2AA
820	10 x 19	16	0.140	990	82	ESX827M010AH4AA
1000	10 x 15	16	0.135	900	100	ESX108M010AH2AA
1000	10 x 19	16	0.120	1060	100	ESX108M010AH4AA
1200	10 x 25	16	0.120	1290	120	ESX128M010AH5AA
1500	10 x 30	16	0.093	1450	150	ESX158M010AH6AA
2200	12 x 30	16	0.087	1570	220	ESX228M010AK2AA
2200	13 x 20	16	0.073	1900	220	ESX228M010AL3AA
3300	10 x 30	16	0.077	1690	330	ESX338M010AH6AA
3300	12 x 35	16	0.062	2110	330	ESX338M010AK3AA
4700	13 x 40	16	0.057	2300	470	ESX478M010AL7AA
4700	16 x 32	16	0.054	2450	470	ESX478M010AM2AA
6800	16 x 36	16	0.046	2680	680	ESX688M010AM3AA
8200	16 x 40	16	0.038	2850	820	ESX828M010AM4AA
10000	18 x 40	16	0.037	3050	1000	ESX109M010AN3AA

Rated cap. 120 Hz 20°C ( $\mu\text{F}$ )	Case size DxL (mm)	16 Vdc Rated voltage - 20 Vdc Surge voltage			L.C. 20°C 2 min. ( $\mu\text{A}$ )	Arcotronics P/N
		D.F. 120 Hz 25°C ( $\text{tg}\delta$ %)	Z 100 kHz 25°C ( $\Omega$ )	R.C. 100kHz 105°C ( $\text{mA}_{\text{rms}}$ )		
22	5 x 11	14	3.300	53	3	ESX226M016AC3AA
33	5 x 11	14	2.100	79	5	ESX336M016AC3AA
47	5 x 11	14	1.300	113	7	ESX476M016AC3AA
68	6 x 11	14	0.920	163	11	ESX686M016AE3AA
100	6 x 11	14	1.100	190	16	ESX107M016AE3AA
100	8 x 11	14	0.890	241	16	ESX107M016AG3AA
120	8 x 11	14	0.580	290	19	ESX127M016AG3AA
150	8 x 11	14	0.470	380	24	ESX157M016AG3AA
220	8 x 11	14	0.330	410	35	ESX227M016AG3AA
330	10 x 12	14	0.230	600	53	ESX337M016AH1AA
470	8 x 20	14	0.180	750	75	ESX477M016AG6AA
470	10 x 15	14	0.180	750	75	ESX477M016AH2AA
680	10 x 19	14	0.140	1050	109	ESX687M016AH4AA
820	10 x 25	14	0.120	1220	131	ESX827M016AH5AA
1000	10 x 30	14	0.091	1400	160	ESX108M016AH6AA
1200	10 x 25	14	0.100	1240	192	ESX128M016AH5AA
1200	12 x 25	14	0.086	1450	192	ESX128M016AK1AA
1500	12 x 25	14	0.072	1650	240	ESX158M016AK1AA
2200	12 x 30	14	0.069	1820	352	ESX228M016AK2AA
2200	13 x 25	14	0.063	2000	352	ESX228M016AL4AA
3300	13 x 40	14	0.055	2400	528	ESX338M016AL7AA
4700	16 x 36	14	0.046	2650	752	ESX478M016AM3AA
6800	18 x 36	14	0.040	2900	1088	ESX688M016AN2AA
8200	18 x 40	14	0.036	3050	1312	ESX828M016AN3AA

For capacitor whose capacitance exceeds 1000  $\mu\text{F}$  the value of D.F. (%) is increased by 2% for every addition of 1000  $\mu\text{F}$

### SINGLE-ENDED LEADS - Low Impedance 105°C / 2000 to 5000 h

Rated cap. 120 Hz 20°C ( $\mu\text{F}$ )	Case size DxL (mm)	25 Vdc Rated voltage - 32 Vdc Surge voltage				L.C. 20°C 2 min. ( $\mu\text{A}$ )	Arcotronics P/N
		D.F. 120 Hz 25°C ( $\text{tg}\delta$ %)	Z 100 kHz 25°C ( $\Omega$ )	R.C. 100kHz 105°C ( $\text{mA}_{\text{rms}}$ )			
22	5 x 11	12	3.300	66	5	ESX226M025AC3AA	
33	5 x 11	12	1.300	99	8	ESX336M025AC3AA	
47	5 x 11	12	1.100	141	12	ESX476M025AC3AA	
47	6 x 11	12	1.100	141	12	ESX476M025AE3AA	
68	8 x 11	12	0.570	204	17	ESX686M025AG3AA	
100	6 x 11	12	0.530	240	25	ESX107M025AE3AA	
100	8 x 11	12	0.420	300	25	ESX107M025AG3AA	
120	8 x 11	12	0.380	400	30	ESX127M025AG3AA	
150	10 x 12	12	0.330	460	37	ESX157M025AH1AA	
220	10 x 15	12	0.230	630	55	ESX227M025AH2AA	
330	10 x 12	12	0.220	690	82	ESX337M025AH1AA	
330	10 x 15	12	0.190	800	82	ESX337M025AH2AA	
470	10 x 15	12	0.165	890	117	ESX477M025AH2AA	
470	10 x 19	12	0.140	1050	117	ESX477M025AH4AA	
680	10 x 30	12	0.090	1400	170	ESX687M025AH6AA	
820	12 x 25	12	0.085	1450	205	ESX827M025AK1AA	
1000	12 x 25	12	0.078	1650	250	ESX108M025AK1AA	
1200	12 x 30	12	0.070	1700	300	ESX128M025AK2AA	
1500	12 x 30	12	0.062	1950	375	ESX158M025AK2AA	
2200	12 x 40	12	0.054	2360	550	ESX228M025AK4AA	
2200	18 x 25	12	0.054	2360	550	ESX228M025AN5AA	
3300	16 x 36	12	0.045	2700	825	ESX338M025AM3AA	
3900	18 x 36	12	0.042	2820	975	ESX398M025AN2AA	
4700	18 x 40	12	0.036	3000	1175	ESX478M025AN3AA	

Rated cap. 120 Hz 20°C ( $\mu\text{F}$ )	Case size DxL (mm)	35 Vdc Rated voltage - 44 Vdc Surge voltage				L.C. 20°C 2 min. ( $\mu\text{A}$ )	Arcotronics P/N
		D.F. 120 Hz 25°C ( $\text{tg}\delta$ %)	Z 100 kHz 25°C ( $\Omega$ )	R.C. 100kHz 105°C ( $\text{mA}_{\text{rms}}$ )			
22	5 x 11	10	1.300	101	8	ESX226M035AC3AA	
33	6 x 11	10	0.870	151	11	ESX336M035AE3AA	
47	8 x 11	10	0.870	216	16	ESX476M035AG3AA	
68	8 x 11	10	0.370	312	24	ESX686M035AG3AA	
100	8 x 11	10	0.390	370	35	ESX107M035AG3AA	
100	10 x 12	10	0.320	460	35	ESX107M035AH1AA	
120	10 x 12	10	0.260	550	42	ESX127M035AH1AA	
150	10 x 12	10	0.230	600	52	ESX157M035AH1AA	
220	10 x 12	10	0.210	690	77	ESX227M035AH1AA	
220	10 x 15	10	0.180	800	77	ESX227M035AH2AA	
330	10 x 19	10	0.130	1060	115	ESX337M035AH4AA	
470	10 x 30	10	0.089	1420	164	ESX477M035AH6AA	
470	13 x 25	10	0.089	1420	164	ESX477M035AL4AA	
680	12 x 25	10	0.070	1650	238	ESX687M035AK1AA	
820	12 x 30	10	0.066	1750	287	ESX827M035AK2AA	
1000	12 x 30	10	0.061	2000	350	ESX108M035AK2AA	
1200	12 x 35	10	0.049	2200	420	ESX128M035AK3AA	
1500	12 x 40	10	0.046	2350	525	ESX158M035AK4AA	
2200	16 x 36	10	0.044	2700	770	ESX228M035AM3AA	
3300	18 x 40	10	0.035	3050	1155	ESX338M035AN3AA	

For capacitor whose capacitance exceeds 1000  $\mu\text{F}$  the value of D.F. (%) is increased by 2% for every addition of 1000  $\mu\text{F}$

### SINGLE-ENDED LEADS - Low Impedance 105°C / 2000 to 5000 h

Rated cap. 120 Hz 20°C ( $\mu\text{F}$ )	Case size DxL (mm)	50 Vdc Rated voltage - 63 Vdc Surge voltage			L.C. 20°C 2 min. ( $\mu\text{A}$ )	Arcotronics P/N
		D.F. 120 Hz 25°C ( $\text{tg}\delta$ %)	Z 100 kHz 25°C ( $\Omega$ )	R.C. 100kHz 105°C ( $\text{mA}_{\text{rms}}$ )		
10	5 x 11	8	2.000	58	5	ESX106M050AC3AA
15	5 x 11	8	1.200	88	7	ESX156M050AC3AA
22	6 x 11	8	0.900	129	11	ESX226M050AE3AA
33	8 x 11	8	0.720	194	16	ESX336M050AG3AA
47	8 x 11	8	0.660	276	23	ESX476M050AG3AA
68	10 x 12	8	0.310	400	34	ESX686M050AH1AA
100	8 x 15	8	0.240	530	50	ESX107M050AG4AA
100	10 x 15	8	0.200	635	50	ESX107M050AH2AA
120	10 x 15	8	0.170	670	60	ESX127M050AH2AA
150	10 x 19	8	0.150	860	75	ESX157M050AH4AA
220	10 x 15	8	0.150	780	110	ESX227M050AH2AA
220	10 x 25	8	0.110	1030	110	ESX227M050AH5AA
330	10 x 30	8	0.086	1300	165	ESX337M050AH6AA
330	13 x 25	8	0.086	1300	165	ESX337M050AL4AA
470	12 x 25	8	0.068	1500	235	ESX477M050AK1AA
680	12 x 35	8	0.058	1850	340	ESX687M050AK3AA
820	12 x 40	8	0.052	2020	410	ESX827M050AK4AA
1000	16 x 25	8	0.060	1800	500	ESX108M050AM7AA
1000	16 x 32	8	0.050	2120	500	ESX108M050AM2AA
1200	16 x 36	8	0.043	2260	600	ESX128M050AM3AA
1500	16 x 40	8	0.035	2420	750	ESX158M050AM4AA

Rated cap. 120 Hz 20°C ( $\mu\text{F}$ )	Case size DxL (mm)	63 Vdc Rated voltage - 79 Vdc Surge voltage			L.C. 20°C 2 min. ( $\mu\text{A}$ )	Arcotronics P/N
		D.F. 120 Hz 25°C ( $\text{tg}\delta$ %)	Z 100 kHz 25°C ( $\Omega$ )	R.C. 100kHz 105°C ( $\text{mA}_{\text{rms}}$ )		
4.7	5 x 11	8	4.600	36	3	ESX475M063AC3AA
6.8	5 x 11	8	4.300	52	4	ESX685M063AC3AA
10	5 x 11	8	2.000	77	6	ESX106M063AC3AA
15	6 x 11	8	1.400	116	9	ESX156M063AE3AA
22	8 x 11	8	1.200	170	14	ESX226M063AG3AA
33	8 x 11	8	0.660	256	21	ESX336M063AG3AA
47	10 x 12	8	0.560	365	30	ESX476M063AH1AA
68	10 x 15	8	0.360	500	43	ESX686M063AH2AA
100	10 x 15	8	0.310	750	63	ESX107M063AH2AA
120	10 x 19	8	0.270	820	76	ESX127M063AH4AA
150	10 x 25	8	0.200	950	94	ESX157M063AH5AA
220	12 x 25	8	0.160	1150	139	ESX227M063AK1AA
330	12 x 30	8	0.130	1420	208	ESX337M063AK2AA
470	12 x 35	8	0.091	1780	296	ESX477M063AK3AA
680	16 x 32	8	0.065	2050	428	ESX687M063AM2AA
820	16 x 36	8	0.056	2200	517	ESX827M063AM3AA
1000	18 x 36	8	0.049	2330	630	ESX108M063AN2AA
1200	18 x 40	8	0.046	2520	756	ESX128M063AN3AA

For capacitor whose capacitance exceeds 1000  $\mu\text{F}$  the value of D.F. (%) is increased by 2% for every addition of 1000  $\mu\text{F}$

### SINGLE-ENDED LEADS - Low Impedance 105°C / 2000 to 5000 h

Rated cap. 120 Hz 20°C ( $\mu\text{F}$ )	Case size DxL (mm)	80 Vdc Rated voltage - 100 Vdc Surge voltage			L.C. 20°C 2 min. ( $\mu\text{A}$ )	Arcotronics P/N
		D.F. 120 Hz 25°C ( $\text{tg}\delta$ %)	Z 100 kHz 25°C ( $\Omega$ )	R.C. 100kHz 105°C ( $\text{mA}_{\text{rms}}$ )		
4.7	5 x 11	7	4.200	43	4	ESX475M080AC3AA
6.8	5 x 11	7	1.900	62	5	ESX685M080AC3AA
10	6 x 11	7	1.400	92	8	ESX106M080AE3AA
15	8 x 11	7	1.100	138	12	ESX156M080AG3AA
22	8 x 11	7	0.640	203	18	ESX226M080AG3AA
33	10 x 12	7	0.540	305	26	ESX336M080AH1AA
47	10 x 15	7	0.360	410	38	ESX476M080AH2AA
68	10 x 19	7	0.260	600	54	ESX686M080AH4AA
100	10 x 25	7	0.190	795	80	ESX107M080AH5AA
120	10 x 30	7	0.170	900	96	ESX127M080AH6AA
150	10 x 30	7	0.150	955	120	ESX157M080AH6AA
220	12 x 30	7	0.130	1200	176	ESX227M080AK2AA
330	12 x 35	7	0.088	1450	264	ESX337M080AK3AA
470	16 x 32	7	0.063	1790	376	ESX477M080AM2AA
680	16 x 40	7	0.058	1990	544	ESX687M080AM4AA
820	18 x 36	7	0.050	2200	656	ESX827M080AN2AA
1000	18 x 40	7	0.044	2370	800	ESX108M080AN3AA

Rated cap. 120 Hz 20°C ( $\mu\text{F}$ )	Case size DxL (mm)	100 Vdc Rated voltage - 125 Vdc Surge voltage			L.C. 20°C 2 min. ( $\mu\text{A}$ )	Arcotronics P/N
		D.F. 120 Hz 25°C ( $\text{tg}\delta$ %)	Z 100 kHz 25°C ( $\Omega$ )	R.C. 100kHz 105°C ( $\text{mA}_{\text{rms}}$ )		
4.7	5 x 11	7	4.100	65	5	ESX475M100AC3AA
6.8	6 x 11	7	1.300	94	7	ESX685M100AE3AA
6.8	8 x 11	7	1.300	94	7	ESX685M100AG3AA
10	8 x 11	7	1.100	138	10	ESX106M100AG3AA
15	8 x 11	7	0.800	207	15	ESX156M100AG3AA
22	10 x 12	7	0.530	305	22	ESX226M100AH1AA
33	10 x 15	7	0.350	500	33	ESX336M100AH2AA
47	10 x 19	7	0.300	600	47	ESX476M100AH4AA
68	10 x 25	7	0.190	795	68	ESX686M100AH5AA
100	10 x 30	7	0.170	870	100	ESX107M100AH6AA
100	13 x 20	7	0.150	955	100	ESX107M100AL3AA
120	12 x 30	7	0.130	1040	120	ESX127M100AK2AA
150	12 x 30	7	0.110	1200	150	ESX157M100AK2AA
220	16 x 32	7	0.086	1440	220	ESX227M100AM2AA
330	16 x 32	7	0.070	1610	330	ESX337M100AM2AA
330	16 x 36	7	0.062	1790	330	ESX337M100AM3AA
470	16 x 40	7	0.047	2200	470	ESX477M100AM4AA
470	18 x 36	7	0.047	2200	470	ESX477M100AN2AA

### 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

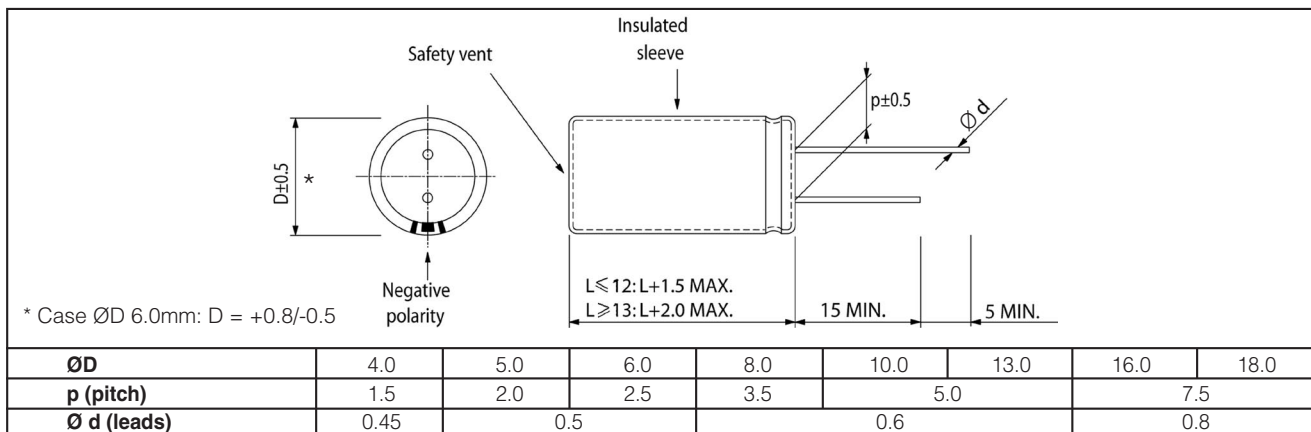
ARCOTRONICS' logo

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

Rated capacitance ( $\mu\text{F}$ ), 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 $\mu\text{F}$ to 6800 $\mu\text{F}$
Capacitance tolerance	$\pm 20\%$ at 120Hz / 20°C
Endurance test	1000 to 5000 h (see conditions in Test method and performance)
Leakage current	$I = 0.01 CV$ ( $\mu\text{A}$ ) or $3\mu\text{A}$ whichever is greater C = rated capacitance ( $\mu\text{F}$ ); 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 $\mu\text{F}$	0.60	0.70	0.85	0.95	1.00
470 to 1000 $\mu\text{F}$	0.65	0.75	0.90	0.98	1.00
1200 to 6800 $\mu\text{F}$	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

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

#### Test method and performance

Conditions	Load life test	Shelf life test															
Temperature: Test duration:	105°C <table border="1"> <thead> <tr> <th colspan="2">Case (mm)</th> <th>Hours</th> </tr> </thead> <tbody> <tr> <td rowspan="2">L = 7</td> <td>ØD ≤ 8.0</td> <td>1000</td> </tr> <tr> <td>ØD ≤ 6.0</td> <td>2000</td> </tr> <tr> <td rowspan="3">L ≥ 11</td> <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> </tbody> </table>	Case (mm)		Hours	L = 7	ØD ≤ 8.0	1000	ØD ≤ 6.0	2000	L ≥ 11	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															
	ØD ≤ 6.0	2000															
L ≥ 11	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.															
<b>Performance</b>	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

Rated cap. 120 Hz 20°C (µF)	Case size DxL (mm)	6.3 Vdc Rated voltage - 8 Vdc Surge voltage			L.C. 20°C 2 min. (µA)	Arcotronics P/N
		D.F. 120 Hz 25°C (tgδ %)	Z 100 kHz 25°C (Ω)	R.C. 100kHz 105°C (mA <sub>rms</sub> )		
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



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

Rated cap. 120 Hz 20°C ( $\mu\text{F}$ )	Case size DxL (mm)	10 Vdc Rated voltage - 13 Vdc Surge voltage			L.C. 20°C 2 min. ( $\mu\text{A}$ )	Arcotronics P/N
		D.F. 120 Hz 25°C ( $\text{tg}\delta$ %)	Z 100 kHz 25°C ( $\Omega$ )	R.C. 100kHz 105°C ( $\text{mA}_{\text{rms}}$ )		
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  $\mu\text{F}$  the value of D.F. (%) is increased by 2% for every addition of 1000  $\mu\text{F}$

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

Rated cap. 120 Hz 20°C ( $\mu\text{F}$ )	Case size DxL (mm)	16 Vdc Rated voltage - 20 Vdc Surge voltage			L.C. 20°C 2 min. ( $\mu\text{A}$ )	Arcotronics P/N
		D.F. 120 Hz 25°C ( $\text{tg}\delta$ %)	Z 100 kHz 25°C ( $\Omega$ )	R.C. 100kHz 105°C ( $\text{mA}_{\text{rms}}$ )		
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  $\mu\text{F}$  the value of D.F. (%) is increased by 2% for every addition of 1000  $\mu\text{F}$

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

Rated cap. 120 Hz 20°C ( $\mu\text{F}$ )	Case size DxL (mm)	25 Vdc Rated voltage - 32 Vdc Surge voltage			L.C. 20°C 2 min. ( $\mu\text{A}$ )	Arcotronics P/N
		D.F. 120 Hz 25°C ( $\text{tg}\delta$ %)	Z 100 kHz 25°C ( $\Omega$ )	R.C. 100kHz 105°C ( $\text{mA}_{\text{rms}}$ )		
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	ESY686M025AE1AA
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  $\mu\text{F}$  the value of D.F. (%) is increased by 2% for every addition of 1000  $\mu\text{F}$

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

Rated cap. 120 Hz 20°C ( $\mu\text{F}$ )	Case size DxL (mm)	35 Vdc Rated voltage - 44 Vdc Surge voltage			L.C. 20°C 2 min. ( $\mu\text{A}$ )	Arcotronics P/N
		D.F. 120 Hz 25°C ( $\text{tg}\delta$ %)	Z 100 kHz 25°C ( $\Omega$ )	R.C. 100kHz 105°C ( $\text{mA}_{\text{rms}}$ )		
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 ( $\mu\text{F}$ )	Case size DxL (mm)	50 Vdc Rated voltage - 63 Vdc Surge voltage			L.C. 20°C 2 min. ( $\mu\text{A}$ )	Arcotronics P/N
		D.F. 120 Hz 25°C ( $\text{tg}\delta$ %)	Z 100 kHz 25°C ( $\Omega$ )	R.C. 100kHz 105°C ( $\text{mA}_{\text{rms}}$ )		
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  $\mu\text{F}$  the value of D.F. (%) is increased by 2% for every addition of 1000  $\mu\text{F}$

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

Rated cap. 120 Hz 20°C ( $\mu\text{F}$ )	Case size DxL (mm)	63 Vdc Rated voltage - 79 Vdc Surge voltage			L.C. 20°C 2 min. ( $\mu\text{A}$ )	Arcotronics P/N
		D.F. 120 Hz 25°C ( $\text{tg}\delta$ %)	Z 100 kHz 25°C ( $\Omega$ )	R.C. 100kHz 105°C ( $\text{mA}_{\text{rms}}$ )		
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  $\mu\text{F}$  the value of D.F. (%) is increased by 2% for every addition of 1000  $\mu\text{F}$

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

Rated cap. 120 Hz 20°C ( $\mu\text{F}$ )	Case size DxL (mm)	100 Vdc Rated voltage - 125 Vdc Surge voltage			L.C. 20°C 2 min. ( $\mu\text{A}$ )	Arcotronics P/N
		D.F. 120 Hz 25°C ( $\text{tg}\delta$ %)	Z 100 kHz 25°C ( $\Omega$ )	R.C. 100kHz 105°C ( $\text{mA}_{\text{rms}}$ )		
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

### SINGLE-ENDED LEADS – Low Impedance and long life 105°C / 5000 h

#### Description

Long life 5000 hours and high reliability.

#### Applications

Electronic ballast and other long life equipment.  
Special designs are available upon request.

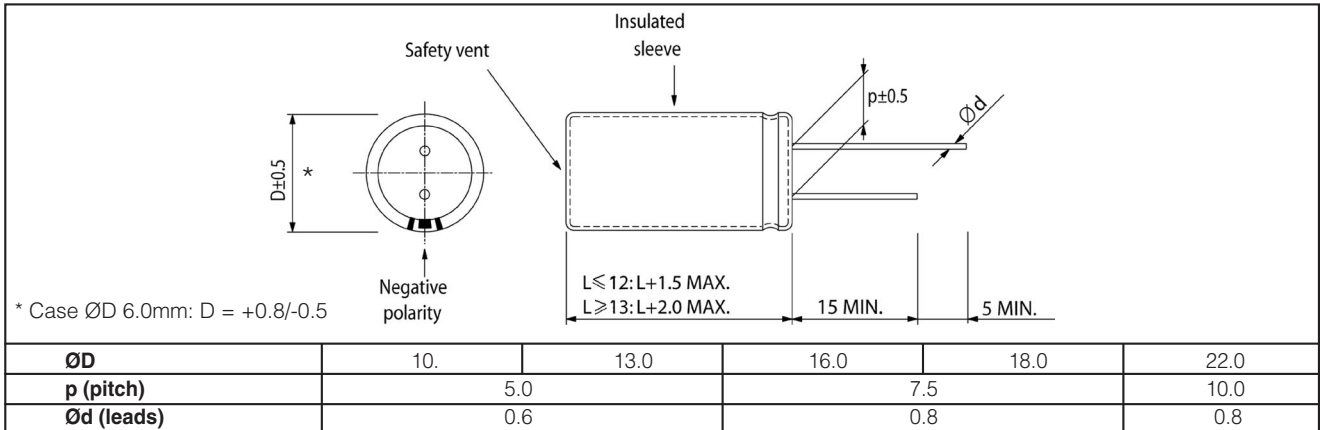
#### Features

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

#### Marking

ARCOTRONICS' logo  
Series: (ESG), Operating temperature: (105°C)  
Capacitance ( $\mu\text{F}$ ), Rated voltage: (Vdc),  
Negative polarity: (white line), Date code

#### Diagram of dimensions (Units=mm)



#### Electrical characteristics

Rated voltage	160 to 400 Vdc	450 Vdc
Operating temperature	-40 to +105°C	-25 to +105°C
Capacitance range	3.3 $\mu\text{F}$ to 330 $\mu\text{F}$	
Capacitance tolerance	$\pm 20\%$ at 120Hz / 20°C	
Endurance test	5000 h (see conditions in Test method and performance)	
Leakage current	$I = 0.06 CV (\mu\text{A}) + 10\mu\text{A}$ $C = \text{rated capacitance } (\mu\text{F}); V = \text{rated voltage (Vdc)}$ (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)	160	200	250	350	400	450
Z (-25°C) / Z (20°C)	3	3	3	5	5	6
Z (-40°C) / Z (20°C)	6	6	6	6	6	

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

Frequency	50 to 60 Hz	120 Hz	300 Hz	1 kHz	10 to 100 kHz
Multiplier factors	0.80	1.00	1.20	1.40	1.60

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

Temperature	65°C	85°C	105°C
Multiplier factors	1.70	1.40	1.00

#### Test method and performance

Conditions	Load life test	Shelf life test
Temperature: Test duration: Ripple current:	105°C 5000 hours max ripple current at 120Hz 105°C specified in the table	105°C 1000 hours no ripple current applied.
Voltage:	the sum of D.C. voltage and the peak A.C. voltage must not exceed the rated voltage of capacitor.	no voltage applied.
Performance	The following specifications will be satisfied when the capacitors will be restored at 20°C.	
Capacitance change: Dissipation factor: Leakage current:	within 20% of initial value. not exceed 200% of the initial requirement. not exceed initial requirement.	within 20% of initial value. not exceed 200% of the initial requirement. not exceed initial requirement.

### SINGLE-ENDED LEADS – Low Impedance and long life 105°C / 5000 h

#### Technical data and ordering codes

Rated cap. 120 Hz 20°C ( $\mu\text{F}$ )	Case size DxL (mm)	160 Vdc Rated voltage - 200 Vdc Surge voltage				L.C. 20°C 2 min. ( $\mu\text{A}$ )	Arcotronics P/N
		D.F. 120 Hz 25°C ( $\text{tg}\delta$ %)	Z 100 kHz 25°C ( $\Omega$ )	R.C. 120 Hz 105°C ( $\text{mA}_{\text{rms}}$ )			
22	10 x 19	15	1.52	160	221	ESG226M160AH4AA	
33	10 x 19	15	1.30	210	327	ESG336M160AH4AA	
47	13 x 20	15	0.95	260	461	ESG476M160AL3AA	
68	13 x 25	15	0.60	360	663	ESG686M160AL4AA	
68	16 x 20	15	0.55	430	663	ESG686M160AM5AA	
100	16 x 25	15	0.30	475	970	ESG107M160AM7AA	
100	18 x 20	15	0.31	465	970	ESG107M160AN4AA	
150	16 x 32	15	0.22	650	1450	ESG157M160AM2AA	
150	18 x 25	15	0.24	625	1450	ESG157M160AN5AA	
220	16 x 32	15	0.22	750	2122	ESG227M160AM2AA	
220	18 x 25	15	0.24	725	2122	ESG227M160AN5AA	
330	18 x 32	15	0.22	960	3178	ESG337M160AN1AA	

Rated cap. 120 Hz 20°C ( $\mu\text{F}$ )	Case size DxL (mm)	200 Vdc Rated voltage - 250 Vdc Surge voltage				L.C. 20°C 2 min. ( $\mu\text{A}$ )	Arcotronics P/N
		D.F. 120 Hz 25°C ( $\text{tg}\delta$ %)	Z 100 kHz 25°C ( $\Omega$ )	R.C. 120 Hz 105°C ( $\text{mA}_{\text{rms}}$ )			
10	10 x 12	15	6.00	60	130	ESG106M200AH1AA	
22	10 x 19	15	1.50	160	274	ESG226M200AH4AA	
33	13 x 20	15	0.95	210	406	ESG336M200AL3AA	
47	13 x 20	15	0.91	260	574	ESG476M200AL3AA	
68	13 x 25	15	0.60	360	826	ESG686M200AL4AA	
68	16 x 20	15	0.55	430	826	ESG686M200AM5AA	
100	16 x 25	15	0.30	475	1210	ESG107M200AM7AA	
100	18 x 20	15	0.31	465	1210	ESG107M200AN4AA	
150	18 x 25	15	0.27	650	1810	ESG157M200AN5AA	
220	18 x 32	15	0.22	780	2650	ESG227M200AN1AA	

Rated cap. 120 Hz 20°C ( $\mu\text{F}$ )	Case size DxL (mm)	250 Vdc Rated voltage - 300 Vdc Surge voltage				L.C. 20°C 2 min. ( $\mu\text{A}$ )	Arcotronics P/N
		D.F. 120 Hz 25°C ( $\text{tg}\delta$ %)	Z 100 kHz 25°C ( $\Omega$ )	R.C. 120 Hz 105°C ( $\text{mA}_{\text{rms}}$ )			
10	10 x 19	15	3.50	100	160	ESG106M250AH4AA	
22	13 x 20	15	2.50	160	340	ESG226M250AL3AA	
33	13 x 20	15	1.90	210	505	ESG336M250AL3AA	
47	13 x 25	15	1.70	270	715	ESG476M250AL4AA	
47	16 x 20	15	1.50	275	715	ESG476M250AM5AA	
68	16 x 25	15	0.80	380	1030	ESG686M250AM7AA	
68	18 x 20	15	0.95	375	1030	ESG686M250AN4AA	
100	16 x 32	15	0.65	520	1510	ESG107M250AM2AA	
100	18 x 25	15	0.65	500	1510	ESG107M250AN5AA	
150	18 x 32	15	0.45	650	2260	ESG157M250AN1AA	
220	18 x 40	15	0.35	820	3310	ESG227M250AN3AA	

Rated cap. 120 Hz 20°C ( $\mu\text{F}$ )	Case size DxL (mm)	350 Vdc Rated voltage - 400 Vdc Surge voltage				L.C. 20°C 2 min. ( $\mu\text{A}$ )	Arcotronics P/N
		D.F. 120 Hz 25°C ( $\text{tg}\delta$ %)	Z 100 kHz 25°C ( $\Omega$ )	R.C. 120 Hz 105°C ( $\text{mA}_{\text{rms}}$ )			
10	10 x 19	20	3.00	100	220	ESG106M350AH4AA	
22	13 x 20	20	2.10	160	472	ESG226M350AL3AA	
33	13 x 25	20	1.00	230	703	ESG336M350AL4AA	
33	16 x 20	20	0.91	250	703	ESG336M350AM5AA	
47	16 x 25	20	0.75	300	997	ESG476M350AM7AA	
47	18 x 20	20	0.80	315	997	ESG476M350AN4AA	
68	16 x 32	20	0.50	400	1438	ESG686M350AM2AA	
68	18 x 25	20	0.55	380	1438	ESG686M350AN5AA	
100	18 x 32	20	0.40	530	2110	ESG107M350AN1AA	



### SINGLE-ENDED LEADS – Low Impedance and long life 105°C / 5000 h

Rated cap. 120 Hz 20°C ( $\mu\text{F}$ )	Case size DxL (mm)	400 Vdc Rated voltage - 450 Vdc Surge voltage				L.C. 20°C 2 min. ( $\mu\text{A}$ )	Arcotronics P/N
		D.F. 120 Hz 25°C ( $\text{tg}\delta$ %)	Z 100 kHz 25°C ( $\Omega$ )	R.C. 120 Hz 105°C ( $\text{mA}_{\text{rms}}$ )			
1.5	10 x 12	24	18.0	35	46	ESG155M400AH1AA	
2.2	10 x 12	24	12.5	40	63	ESG225M400AH1AA	
3.3	10 x 12	24	8.00	45	90	ESG335M400AH1AA	
4.7	10 x 15	24	3.50	50	123	ESG475M400AH2AA	
6.8	10 x 19	24	3.30	70	173	ESG685M400AH4AA	
10	10 x 19	24	2.90	100	250	ESG106M400AH4AA	
22	13 x 25	24	1.35	170	538	ESG226M400AL4AA	
22	16 x 20	24	1.00	200	538	ESG226M400AM5AA	
33	16 x 25	24	0.95	230	802	ESG336M400AM7AA	
33	18 x 20	24	0.91	250	802	ESG336M400AN4AA	
47	16 x 32	24	0.75	300	1138	ESG476M400AM2AA	
47	18 x 25	24	0.80	325	1138	ESG476M400AN5AA	
68	18 x 36	24	0.49	420	1642	ESG686M400AN2AA	
100	18 x 40	24	0.34	545	2410	ESG107M400AN3AA	
150	22 x 40	24	0.30	650	3610	ESG157M400AQ4AA	

Rated cap. 120 Hz 20°C ( $\mu\text{F}$ )	Case size DxL (mm)	450 Vdc Rated voltage - 500 Vdc Surge voltage				L.C. 20°C 2 min. ( $\mu\text{A}$ )	Arcotronics P/N
		D.F. 120 Hz 25°C ( $\text{tg}\delta$ %)	Z 100 kHz 25°C ( $\Omega$ )	R.C. 120 Hz 105°C ( $\text{mA}_{\text{rms}}$ )			
3.3	10 x 19	24	6.50	60	99	ESG335M450AH4AA	
4.7	13 x 20	24	3.60	80	137	ESG475M450AL3AA	
6.8	10 x 19	24	3.40	90	194	ESG685M450AH4AA	
10	13 x 20	24	3.00	110	280	ESG106M450AL3AA	
22	16 x 25	24	1.80	190	604	ESG226M450AM7AA	
22	18 x 20	24	2.20	200	604	ESG226M450AN4AA	
33	16 x 32	24	1.30	275	901	ESG336M450AM2AA	
33	18 x 25	24	1.20	280	901	ESG336M450AN5AA	
47	18 x 32	24	1.00	340	1279	ESG476M450AN1AA	
68	18 x 40	24	0.80	460	1846	ESG686M450AN3AA	
100	22 x 40	24	0.60	580	2710	ESG107M450AQ4AA	

### SINGLE-ENDED LEADS – Low Impedance and long life 105°C / 3000-6000 h

#### Description

Long life 3000-6000 hours and high reliability.

#### Applications

High frequency switching mode circuits.

#### Features

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

Different case size available for capacitance value.

#### Marking

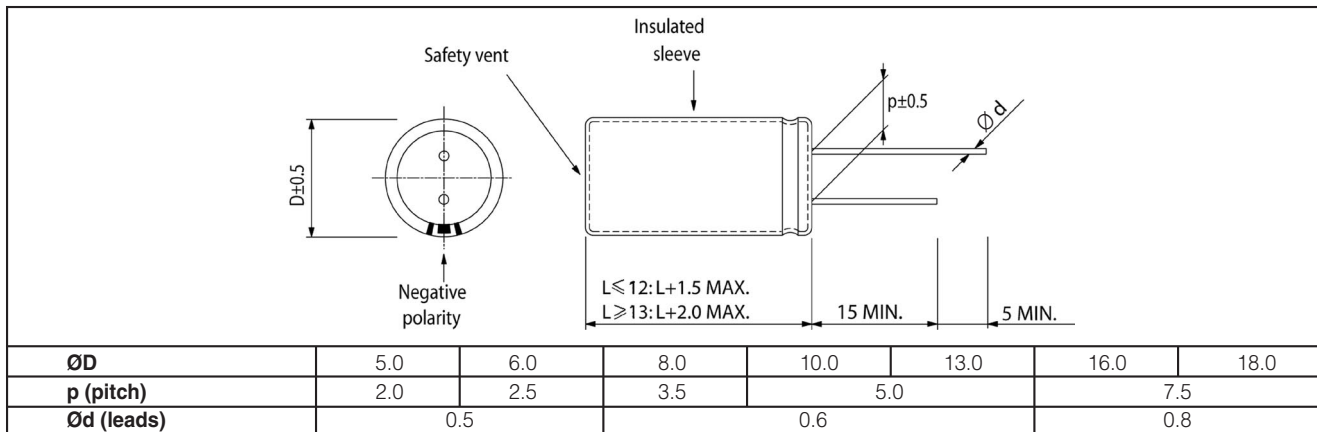
ARCOTRONICS' logo

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

Capacitance ( $\mu\text{F}$ ), Rated voltage: (Vdc),

Negative polarity: (white 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	0.47 $\mu\text{F}$ to 15000 $\mu\text{F}$
Capacitance tolerance	$\pm 20\%$ at 120Hz / 20°C
Endurance test	3000 to 6000 h (see conditions in Test method and performance)
Leakage current	$I = 0.01 \text{ CV } (\mu\text{A})$ or $3\mu\text{A}$ whichever is greater C = rated capacitance ( $\mu\text{F}$ ); 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

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

Capacitance range	120 Hz	1 KHz	10 KHz	100 KHz
0.47 $\mu\text{F}$ to 33 $\mu\text{F}$	0.42	0.70	0.90	1.00
39 $\mu\text{F}$ to 270 $\mu\text{F}$	0.50	0.73	0.92	1.00
330 $\mu\text{F}$ to 680 $\mu\text{F}$	0.55	0.77	0.94	1.00
820 $\mu\text{F}$ to 1800 $\mu\text{F}$	0.60	0.80	0.96	1.00
2200 $\mu\text{F}$ to 15000 $\mu\text{F}$	0.70	0.85	0.98	1.00

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

Temperature	65°C	85°C	105°C
Multiplier factors	2.1	1.7	1.0

#### Test method and performance

Conditions	Load life test	Shelf life test
Temperature: Test duration:  Ripple current: Voltage:	105°C $\leq \varnothing 6.0\text{mm}$ : 3000 h $\varnothing 8.0\text{mm}$ : 4000 h $\varnothing 10.0\text{mm}$ : 5000 h $\geq \varnothing 13.0\text{mm}$ : 6000 h 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.	105°C 1000 hours  no ripple current applied. no voltage applied.
<b>Performance</b>	The following specifications will be satisfied when the capacitors will be restored at 25°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.

### SINGLE-ENDED LEADS - Low Impedance and long life 105°C / 3000-6000 h

#### Technical data and ordering codes

Rated cap. 120 Hz 20°C ( $\mu$ F)	Case size DxL (mm)	6.3 Vdc Rated voltage - 8 Vdc Surge voltage			L.C. 20°C 2 min. ( $\mu$ A)	Arcotronics P/N
		D.F. 120 Hz 25°C (tg $\delta$ %)	Z 100 kHz 25°C ( $\Omega$ )	R.C. 100kHz 105°C (mA <sub>rms</sub> )		
22	5 x 11	22	0.600	180	3	ESW226M6R3AC3AA
33	5 x 11	22	0.600	180	3	ESW336M6R3AC3AA
47	5 x 11	22	0.600	180	3	ESW476M6R3AC3AA
100	5 x 11	22	0.600	180	6	ESW107M6R3AC3AA
150	6 x 11	22	0.250	290	9	ESW157M6R3AE3AA
220	6 x 11	22	0.250	290	14	ESW227M6R3AE3AA
330	6 x 11	22	0.250	290	21	ESW337M6R3AE3AA
330	6 x 15	22	0.230	430	21	ESW337M6R3AE4AA
470	8 x 11	22	0.117	555	30	ESW477M6R3AG3AA
560	8 x 11	22	0.117	555	35	ESW567M6R3AG3AA
680	10 x 12	22	0.090	755	43	ESW687M6R3AH1AA
820	8 x 15	22	0.085	730	52	ESW827M6R3AG4AA
820	10 x 12	22	0.090	755	52	ESW827M6R3AH1AA
1000	10 x 12	22	0.090	755	63	ESW108M6R3AH1AA
1200	8 x 20	22	0.065	955	76	ESW128M6R3AG6AA
1200	10 x 15	22	0.068	1050	76	ESW128M6R3AH2AA
1500	10 x 19	22	0.052	1220	94	ESW158M6R3AH4AA
2200	10 x 25	22	0.045	1440	139	ESW228M6R3AH5AA
2200	13 x 20	22	0.038	1815	139	ESW228M6R3AL3AA
2700	10 x 30	22	0.035	1815	170	ESW278M6R3AH6AA
3300	13 x 20	22	0.038	1655	208	ESW338M6R3AL3AA
3900	13 x 25	22	0.030	1945	246	ESW398M6R3AL4AA
4700	16 x 25	22	0.022	2555	296	ESW478M6R3AM7AA
4700	13 x 30	22	0.025	2310	296	ESW478M6R3AL8AA
5600	13 x 36	22	0.022	2510	353	ESW568M6R3AL6AA
5600	16 x 20	22	0.029	2205	353	ESW568M6R3AM5AA
6800	16 x 25	22	0.022	2555	428	ESW688M6R3AM7AA
6800	18 x 20	22	0.028	2490	428	ESW688M6R3AN4AA
8200	16 x 32	22	0.018	3010	517	ESW828M6R3AM2AA
10000	16 x 32	22	0.016	3150	630	ESW109M6R3AM2AA
10000	18 x 25	22	0.020	2740	630	ESW109M6R3AN5AA
12000	18 x 32	22	0.016	3635	756	ESW129M6R3AN1AA
15000	18 x 36	22	0.015	3680	945	ESW159M6R3AN2AA

### SINGLE-ENDED LEADS - Low Impedance and long life 105°C / 3000-6000 h

Rated cap. 120 Hz 20°C ( $\mu$ F)	Case size DxL (mm)	10 Vdc Rated voltage - 13 Vdc Surge voltage			L.C. 20°C 2 min. ( $\mu$ A)	Arcotronics P/N
		D.F. 120 Hz 25°C (tg $\delta$ %)	Z 100 kHz 25°C ( $\Omega$ )	R.C. 100kHz 105°C (mA <sub>rms</sub> )		
22	5 x 11	19	0.600	180	3	ESW226M010AC3AA
33	5 x 11	19	0.600	180	3	ESW336M010AC3AA
47	5 x 11	19	0.600	180	5	ESW476M010AC3AA
82	5 x 11	19	0.600	180	8	ESW826M010AC3AA
100	5 x 11	19	0.600	180	10	ESW107M010AC3AA
150	6 x 11	19	0.250	290	15	ESW157M010AE3AA
180	6 x 11	19	0.250	290	18	ESW187M010AE3AA
220	6 x 11	19	0.250	290	22	ESW227M010AE3AA
220	6 x 15	19	0.230	430	22	ESW227M010AE4AA
330	8 x 11	19	0.117	555	33	ESW337M010AG3AA
470	8 x 11	19	0.117	555	47	ESW477M010AG3AA
680	8 x 15	19	0.085	730	68	ESW687M010AG4AA
680	10 x 12	19	0.090	755	68	ESW687M010AH1AA
1000	8 x 20	19	0.065	995	100	ESW108M010AG6AA
1000	10 x 15	19	0.068	1050	100	ESW108M010AH2AA
1200	10 x 19	19	0.052	1220	120	ESW128M010AH4AA
1500	10 x 19	19	0.052	1220	150	ESW158M010AH4AA
1500	10 x 25	19	0.045	1440	150	ESW158M010AH5AA
2200	10 x 30	19	0.035	1815	220	ESW228M010AH6AA
2200	13 x 20	19	0.038	1655	220	ESW228M010AL3AA
2700	13 x 25	19	0.030	1945	270	ESW278M010AL4AA
3300	13 x 25	19	0.030	1945	330	ESW338M010AL4AA
3300	13 x 30	19	0.025	2310	330	ESW338M010AL8AA
3900	13 x 36	19	0.022	2510	390	ESW398M010AL6AA
3900	16 x 20	19	0.029	2205	390	ESW398M010AM5AA
4700	16 x 25	19	0.022	2555	470	ESW478M010AM7AA
5600	16 x 25	19	0.022	2555	560	ESW568M010AM7AA
5600	18 x 20	19	0.028	2490	560	ESW568M010AN4AA
6800	16 x 32	19	0.018	3010	680	ESW688M010AM2AA
6800	18 x 25	19	0.020	2740	680	ESW688M010AN5AA
8200	16 x 36	19	0.016	3150	820	ESW828M010AM3AA
8200	18 x 32	19	0.016	3635	820	ESW828M010AN1AA
10000	18 x 36	19	0.015	3680	1000	ESW109M010AN2AA
15000	18 x 40	19	0.014	3800	1500	ESW159M010AN3AA

### SINGLE-ENDED LEADS - Low Impedance and long life 105°C / 3000-6000 h

Rated cap. 120 Hz 20°C ( $\mu\text{F}$ )	Case size DxL (mm)	16 Vdc Rated voltage - 20 Vdc Surge voltage			L.C. 20°C 2 min. ( $\mu\text{A}$ )	Arcotronics P/N
		D.F. 120 Hz 25°C ( $\text{tg}\delta$ %)	Z 100 kHz 25°C ( $\Omega$ )	R.C. 100kHz 105°C ( $\text{mA}_{\text{rms}}$ )		
10	5 x 11	16	0.600	180	3	ESW106M016AC3AA
22	5 x 11	16	0.600	180	4	ESW226M016AC3AA
33	5 x 11	16	0.600	180	5	ESW336M016AC3AA
47	5 x 11	16	0.600	180	8	ESW476M016AC3AA
56	5 x 11	16	0.600	180	9	ESW566M016AC3AA
100	6 x 11	16	0.250	290	16	ESW107M016AE3AA
120	6 x 11	16	0.250	290	19	ESW127M016AE3AA
150	6 x 11	16	0.250	290	24	ESW157M016AE3AA
180	6 x 15	16	0.230	430	29	ESW187M016AE4AA
220	8 x 11	16	0.117	555	35	ESW227M016AG3AA
330	8 x 11	16	0.117	555	53	ESW337M016AG3AA
470	8 x 15	16	0.085	730	75	ESW477M016AG4AA
470	10 x 12	16	0.090	755	75	ESW477M016AH1AA
680	8 x 20	16	0.065	995	109	ESW687M016AG6AA
680	10 x 15	16	0.068	1050	109	ESW687M016AH2AA
820	10 x 19	16	0.052	1220	131	ESW827M016AH4AA
1000	10 x 19	16	0.052	1220	160	ESW108M016AH4AA
1200	10 x 25	16	0.045	1440	192	ESW128M016AH5AA
1500	10 x 30	16	0.035	1815	240	ESW158M016AH6AA
1500	13 x 20	16	0.038	1655	240	ESW158M016AL3AA
2200	13 x 25	16	0.030	1945	352	ESW228M016AL4AA
2700	13 x 30	16	0.025	2310	432	ESW278M016AL8AA
2700	16 x 20	16	0.029	2205	432	ESW278M016AM5AA
3300	13 x 36	16	0.022	2510	528	ESW338M016AL6AA
3300	16 x 25	16	0.022	2555	528	ESW338M016AM7AA
3900	16 x 25	16	0.022	2555	624	ESW398M016AM7AA
3900	18 x 20	16	0.028	2490	624	ESW398M016AN4AA
4700	16 x 32	16	0.018	3010	752	ESW478M016AM2AA
4700	18 x 25	16	0.020	2740	752	ESW478M016AN5AA
5600	18 x 32	16	0.016	3150	896	ESW568M016AN1AA
5600	18 x 36	16	0.016	3635	896	ESW568M016AN2AA
6800	18 x 36	16	0.015	3680	1088	ESW688M016AN2AA
8200	18 x 36	16	0.015	3680	1312	ESW828M016AN2AA
10000	18 x 40	16	0.014	3800	1600	ESW109M016AN3AA

### SINGLE-ENDED LEADS - Low Impedance and long life 105°C / 3000-6000 h

Rated cap. 120 Hz 20°C ( $\mu\text{F}$ )	Case size DxL (mm)	25 Vdc Rated voltage - 32 Vdc Surge voltage			L.C. 20°C 2 min. ( $\mu\text{A}$ )	Arcotronics P/N
		D.F. 120 Hz 25°C ( $\text{tg}\delta$ %)	Z 100 kHz 25°C ( $\Omega$ )	R.C. 100kHz 105°C ( $\text{mA}_{\text{rms}}$ )		
4.7	5 x 11	14	0.600	180	3	ESW475M025AC3AA
10	5 x 11	14	0.600	180	3	ESW106M025AC3AA
22	5 x 11	14	0.600	180	5	ESW226M025AC3AA
33	5 x 11	14	0.600	180	8	ESW336M025AC3AA
39	5 x 11	14	0.600	180	10	ESW396M025AC3AA
47	5 x 11	14	0.600	180	12	ESW476M025AC3AA
82	6 x 11	14	0.250	290	20	ESW826M025AE3AA
100	6 x 11	14	0.250	290	25	ESW107M025AE3AA
120	6 x 15	14	0.230	430	30	ESW127M025AE4AA
150	8 x 11	14	0.117	555	37	ESW157M025AG3AA
220	8 x 11	14	0.117	555	55	ESW227M025AG3AA
330	8 x 15	14	0.085	730	82	ESW337M025AG4AA
330	10 x 12	14	0.090	755	82	ESW337M025AH1AA
470	8 x 20	14	0.065	995	117	ESW477M025AG6AA
470	10 x 15	14	0.068	1050	117	ESW477M025AH2AA
560	10 x 19	14	0.052	1220	140	ESW567M025AH4AA
680	10 x 19	14	0.052	1220	170	ESW687M025AH4AA
820	10 x 25	14	0.045	1440	205	ESW827M025AH5AA
1000	10 x 30	14	0.035	1815	250	ESW108M025AH6AA
1000	13 x 20	14	0.038	1655	250	ESW108M025AL3AA
1500	13 x 25	14	0.030	1945	375	ESW158M025AL4AA
1500	16 x 25	14	0.022	2555	375	ESW158M025AM7AA
1800	13 x 30	14	0.025	2310	450	ESW188M025AL8AA
1800	16 x 20	14	0.029	2205	450	ESW188M025AM5AA
2200	13 x 36	14	0.022	2510	550	ESW228M025AL6AA
2200	16 x 25	14	0.022	2555	550	ESW228M025AM7AA
2200	18 x 20	14	0.028	2490	550	ESW228M025AN4AA
2700	16 x 25	14	0.022	2555	675	ESW278M025AM7AA
3300	16 x 32	14	0.018	3010	825	ESW338M025AM2AA
3300	18 x 25	14	0.020	2740	825	ESW338M025AN5AA
3900	16 x 36	14	0.016	3150	975	ESW398M025AM3AA
3900	18 x 32	14	0.016	3635	975	ESW398M025AN1AA
4700	18 x 36	14	0.015	3680	1175	ESW478M025AN2AA
6800	18 x 40	14	0.014	3800	1700	ESW688M025AN3AA

### SINGLE-ENDED LEADS - Low Impedance and long life 105°C / 3000-6000 h

Rated cap. 120 Hz 20°C ( $\mu\text{F}$ )	Case size DxL (mm)	35 Vdc Rated voltage - 44 Vdc Surge voltage			L.C. 20°C 2 min. ( $\mu\text{A}$ )	Arcotronics P/N
		D.F. 120 Hz 25°C ( $\text{tg}\delta$ %)	Z 100 kHz 25°C ( $\Omega$ )	R.C. 100kHz 105°C ( $\text{mA}_{\text{rms}}$ )		
4.7	5 x 11	12	0.600	180	3	ESW475M035AC3AA
10	5 x 11	12	0.600	180	3	ESW106M035AC3AA
22	5 x 11	12	0.600	180	8	ESW226M035AC3AA
27	5 x 11	12	0.600	180	9	ESW276M035AC3AA
33	5 x 11	12	0.600	180	12	ESW336M035AC3AA
47	6 x 11	12	0.250	290	16	ESW476M035AE3AA
56	6 x 11	12	0.250	290	20	ESW566M035AE3AA
82	6 x 15	12	0.230	430	29	ESW826M035AE4AA
100	8 x 11	12	0.117	555	35	ESW107M035AG3AA
150	8 x 11	12	0.117	555	52	ESW157M035AG3AA
220	8 x 15	12	0.085	730	77	ESW227M035AG4AA
220	10 x 12	12	0.090	755	77	ESW227M035AH1AA
330	8 x 20	12	0.065	995	115	ESW337M035AG6AA
330	10 x 15	12	0.068	1050	115	ESW337M035AH2AA
390	10 x 19	12	0.052	1220	136	ESW397M035AH4AA
470	10 x 19	12	0.052	1220	164	ESW477M035AH4AA
560	10 x 25	12	0.045	1440	196	ESW567M035AH5AA
680	10 x 30	12	0.035	1815	238	ESW687M035AH6AA
680	13 x 20	12	0.038	1655	238	ESW687M035AL3AA
1000	13 x 25	12	0.030	1945	350	ESW108M035AL4AA
1200	13 x 30	12	0.025	2310	420	ESW128M035AL8AA
1200	16 x 20	12	0.029	2205	420	ESW128M035AM5AA
1500	13 x 36	12	0.022	2510	525	ESW158M035AL6AA
1500	16 x 25	12	0.022	2555	525	ESW158M035AM7AA
1800	16 x 25	12	0.022	2555	630	ESW188M035AM7AA
1800	18 x 20	12	0.028	2490	630	ESW188M035AN4AA
2200	16 x 32	12	0.018	3010	770	ESW228M035AM2AA
2200	18 x 25	12	0.020	2740	770	ESW228M035AN5AA
2700	16 x 36	12	0.016	3150	945	ESW278M035AM3AA
2700	18 x 32	12	0.016	3635	945	ESW278M035AN1AA
3300	18 x 36	12	0.015	3680	1155	ESW338M035AN2AA
4700	18 x 40	12	0.014	3800	1645	ESW478M035AN3AA

### SINGLE-ENDED LEADS - Low Impedance and long life 105°C / 3000-6000 h

Rated cap. 120 Hz 20°C ( $\mu\text{F}$ )	Case size DxL (mm)	50 Vdc Rated voltage - 63 Vdc Surge voltage			L.C. 20°C 2 min. ( $\mu\text{A}$ )	Arcotronics P/N
		D.F. 120 Hz 25°C ( $\text{tg}\delta$ %)	Z 100 kHz 25°C ( $\Omega$ )	R.C. 100kHz 105°C ( $\text{mA}_{\text{rms}}$ )		
4.7	5 x 11	10	2.300	90	3	ESW475M050AC3AA
10	5 x 11	10	1.400	120	5	ESW106M050AC3AA
18	5 x 11	10	1.300	155	9	ESW186M050AC3AA
22	5 x 11	10	1.200	170	11	ESW226M050AC3AA
33	6 x 11	10	0.430	300	16	ESW336M050AE3AA
47	6 x 11	10	0.430	300	23	ESW476M050AE3AA
56	6 x 15	10	0.400	360	28	ESW566M050AE4AA
82	8 x 11	10	0.234	485	41	ESW826M050AG3AA
100	8 x 11	10	0.234	485	50	ESW107M050AG3AA
120	8 x 15	10	0.155	635	60	ESW127M050AG4AA
120	10 x 12	10	0.162	615	60	ESW127M050AH1AA
150	10 x 12	10	0.162	615	75	ESW157M050AH1AA
180	8 x 20	10	0.120	860	90	ESW187M050AG6AA
180	10 x 15	10	0.119	850	90	ESW187M050AH2AA
220	10 x 15	10	0.119	850	110	ESW227M050AH2AA
220	10 x 19	10	0.090	1030	110	ESW227M050AH4AA
270	10 x 25	10	0.082	1200	135	ESW277M050AH5AA
330	10 x 19	10	0.090	1030	165	ESW337M050AH4AA
330	10 x 30	10	0.060	1610	165	ESW337M050AH6AA
390	13 x 20	10	0.063	1480	195	ESW397M050AL3AA
470	13 x 20	10	0.060	1500	235	ESW477M050AL3AA
560	13 x 25	10	0.050	1832	280	ESW567M050AL4AA
680	13 x 25	10	0.050	1832	340	ESW687M050AL4AA
680	16 x 20	10	0.048	1835	340	ESW687M050AM5AA
820	13 x 36	10	0.034	2285	410	ESW827M050AL6AA
820	18 x 20	10	0.042	2420	410	ESW827M050AN4AA
1000	16 x 25	10	0.034	2235	500	ESW108M050AM7AA
1200	16 x 32	10	0.028	2700	600	ESW128M050AM2AA
1200	18 x 25	10	0.029	2610	600	ESW128M050AN5AA
1500	16 x 32	10	0.028	2700	750	ESW158M050AM2AA
1500	16 x 36	10	0.025	2790	750	ESW158M050AM3AA
1800	18 x 32	10	0.025	3000	900	ESW188M050AN1AA
2200	18 x 36	10	0.023	3100	1100	ESW228M050AN2AA



### SINGLE-ENDED LEADS - Low Impedance and long life 105°C / 3000-6000 h

Rated cap. 120 Hz 20°C ( $\mu$ F)	Case size DxL (mm)	63 Vdc Rated voltage - 79 Vdc Surge voltage			L.C. 20°C 2 min. ( $\mu$ A)	Arcotronics P/N
		D.F. 120 Hz 25°C (tg $\delta$ %)	Z 100 kHz 25°C ( $\Omega$ )	R.C. 100kHz 105°C (mA <sub>rms</sub> )		
4.7	5 x 11	9	4.700	68	3	ESW475M063AC3AA
6.8	5 x 11	9	2.500	95	4	ESW685M063AC3AA
10	5 x 11	9	2.100	110	6	ESW106M063AC3AA
12	5 x 11	9	2.000	145	8	ESW126M063AC3AA
15	6 x 11	9	1.200	160	9	ESW156M063AE3AA
22	6 x 11	9	0.710	250	14	ESW226M063AE3AA
33	6 x 11	9	0.710	250	21	ESW336M063AE3AA
39	6 x 15	9	0.700	330	25	ESW396M063AE4AA
47	8 x 11	9	0.342	405	30	ESW476M063AG3AA
68	8 x 11	9	0.342	405	43	ESW686M063AG3AA
100	8 x 15	9	0.230	535	63	ESW107M063AG4AA
100	10 x 12	9	0.256	535	63	ESW107M063AH1AA
120	10 x 15	9	0.194	600	76	ESW127M063AH2AA
150	10 x 15	9	0.194	660	94	ESW157M063AH2AA
180	10 x 19	9	0.147	885	113	ESW187M063AH4AA
180	13 x 16	9	0.150	1020	113	ESW187M063AL2AA
220	10 x 19	9	0.147	885	139	ESW227M063AH4AA
220	10 x 25	9	0.130	1050	139	ESW227M063AH5AA
270	16 x 15	9	0.090	1410	170	ESW277M063AM6AA
330	13 x 20	9	0.085	1285	208	ESW337M063AL3AA
390	13 x 25	9	0.070	1720	246	ESW397M063AL4AA
390	18 x 16	9	0.086	1690	246	ESW397M063AN6AA
470	13 x 25	9	0.070	1720	296	ESW477M063AL4AA
470	13 x 30	9	0.055	2090	296	ESW477M063AL8AA
470	16 x 20	9	0.059	1765	296	ESW477M063AM5AA
560	16 x 25	9	0.050	2160	353	ESW567M063AM7AA
680	13 x 36	9	0.047	2265	428	ESW687M063AL6AA
680	18 x 20	9	0.055	2290	428	ESW687M063AN4AA
820	16 x 32	9	0.043	2670	517	ESW827M063AM2AA
820	18 x 25	9	0.043	2585	517	ESW827M063AN5AA
1000	16 x 32	9	0.043	2670	630	ESW108M063AM2AA
1000	16 x 36	9	0.036	2770	630	ESW108M063AM3AA
1200	18 x 32	9	0.032	2950	756	ESW128M063AN1AA
1500	18 x 36	9	0.030	3095	945	ESW158M063AN2AA
2200	18 x 40	9	0.028	3200	1386	ESW228M063AN3AA

### SINGLE-ENDED LEADS - Low Impedance and long life 105°C / 3000-6000 h

Rated cap. 120 Hz 20°C ( $\mu$ F)	Case size DxL (mm)	100 Vdc Rated voltage - 125 Vdc Surge voltage			L.C. 20°C 2 min. ( $\mu$ A)	Arcotronics P/N
		D.F. 120 Hz 25°C (tg $\delta$ %)	Z 100 kHz 25°C ( $\Omega$ )	R.C. 100kHz 105°C (mA <sub>rms</sub> )		
0.47	5 x 11	8	43	20	3	ESW474M100AC3AA
1	5 x 11	8	20	30	3	ESW105M100AC3AA
2.2	5 x 11	8	9.800	44	3	ESW225M100AC3AA
3.3	5 x 11	8	6.600	58	3	ESW335M100AC3AA
4.7	5 x 11	8	4.600	74	5	ESW475M100AC3AA
6.8	5 x 11	8	3.500	95	7	ESW685M100AC3AA
10	6 x 11	8	1.800	130	10	ESW106M100AE3AA
15	8 x 11	8	0.830	180	15	ESW156M100AG3AA
18	6 x 15	8	0.800	200	18	ESW186M100AE4AA
22	8 x 11	8	0.680	230	22	ESW226M100AG3AA
33	8 x 15	8	0.450	360	33	ESW336M100AG4AA
33	10 x 12	8	0.460	320	33	ESW336M100AH1AA
47	8 x 20	8	0.370	420	47	ESW476M100AG6AA
47	10 x 15	8	0.370	420	47	ESW476M100AH2AA
68	10 x 19	8	0.300	490	68	ESW686M100AH4AA
82	10 x 25	8	0.250	540	82	ESW826M100AH5AA
100	13 x 20	8	0.180	580	100	ESW107M100AL3AA
150	13 x 25	8	0.130	710	150	ESW157M100AL4AA
180	13 x 30	8	0.120	790	180	ESW187M100AL8AA
180	16 x 20	8	0.130	750	180	ESW187M100AM5AA
220	16 x 25	8	0.100	890	220	ESW227M100AM7AA
220	18 x 20	8	0.110	850	220	ESW227M100AN4AA
330	16 x 25	8	0.090	1080	330	ESW337M100AM7AA
390	18 x 25	8	0.083	1260	390	ESW397M100AN5AA
470	16 x 32	8	0.076	1310	470	ESW477M100AM2AA
560	18 x 32	8	0.068	1370	560	ESW567M100AN1AA
560	18 x 36	8	0.064	1410	560	ESW567M100AN2AA
820	18 x 40	8	0.047	1520	820	ESW827M100AN3AA

### SINGLE-ENDED LEADS – Low Impedance and long life 105°C / 3000-10000 h

#### Description

Long life 3000-10000 hours and high reliability.

#### Applications

High frequency switching mode circuits.

#### Features

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

Different case size available for capacitance value.

#### Marking

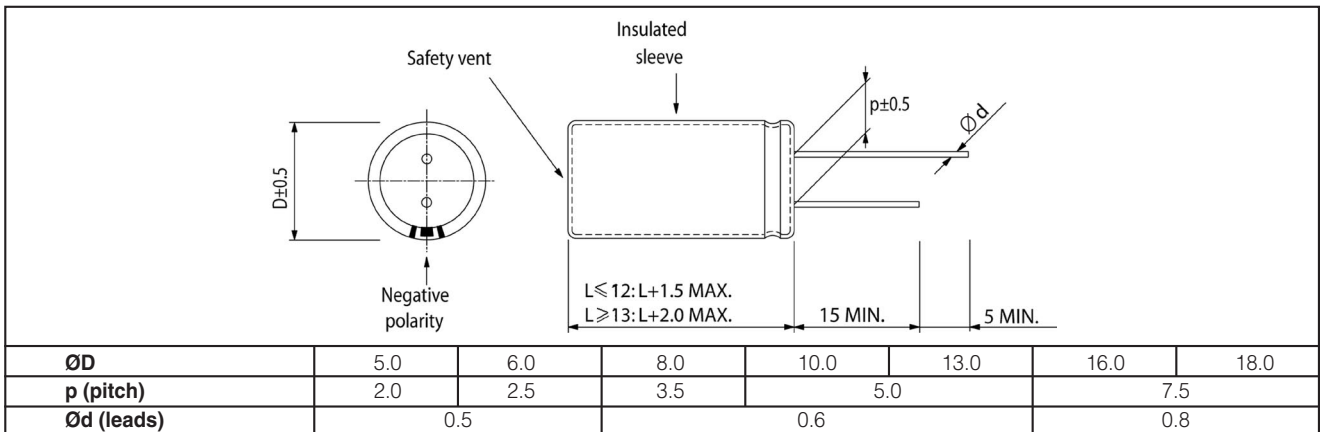
ARCOTRONICS' logo

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

Capacitance ( $\mu\text{F}$ ), Rated voltage: (Vdc),

Negative polarity: (white line), Date code

#### Diagram of dimensions (Units=mm)



#### Electrical characteristics

Rated voltage	6.3 to 35 Vdc
Operating temperature	-40 to +105°C
Capacitance range	27 $\mu\text{F}$ to 6800 $\mu\text{F}$
Capacitance tolerance	$\pm 20\%$ at 120Hz / 20°C
Endurance test	3000 to 10000 h (see conditions in Test method and performance)
Leakage current	$I = 0.01 \text{ CV } (\mu\text{A})$ or $3\mu\text{A}$ whichever is greater C = rated capacitance ( $\mu\text{F}$ ); 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
Z (-25°C) / Z (20°C)	4	3	2	2	2
Z (-40°C) / Z (20°C)	8	6	4	3	3

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

Capacitance range	120 Hz	1 KHz	10 KHz	100 KHz
22 $\mu\text{F}$ to 33 $\mu\text{F}$	0.55	0.75	0.90	1.00
39 $\mu\text{F}$ to 330 $\mu\text{F}$	0.70	0.85	0.95	1.00
390 $\mu\text{F}$ to 1000 $\mu\text{F}$	0.80	0.90	0.98	1.00
$\leq 6800\mu\text{F}$	0.90	0.95	1.00	1.00

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

Temperature	65°C	85°C	105°C
Multiplier factors	2.1	1.7	1.0

#### Test method and performance

Conditions	Load life test	Shelf life test										
Temperature: Test duration:	105°C <table border="1"> <tr> <td>6.3 to 10 Vdc</td> <td>16 to 35 Vdc</td> </tr> <tr> <td><math>\leq \varnothing 6.0\text{mm}</math>: 3000 h</td> <td><math>\leq \varnothing 6.0\text{mm}</math>: 4000 h</td> </tr> <tr> <td><math>\varnothing 8.0 - 10.0\text{mm}</math>: 6000 h</td> <td><math>\varnothing 8.0\text{mm}</math>: 6000 h</td> </tr> <tr> <td><math>\geq \varnothing 13.0\text{mm}</math>: 8000 h</td> <td><math>\varnothing 10.0\text{mm}</math>: 8000 h</td> </tr> <tr> <td></td> <td><math>\geq \varnothing 13.0\text{mm}</math>: 10000 h</td> </tr> </table>	6.3 to 10 Vdc	16 to 35 Vdc	$\leq \varnothing 6.0\text{mm}$ : 3000 h	$\leq \varnothing 6.0\text{mm}$ : 4000 h	$\varnothing 8.0 - 10.0\text{mm}$ : 6000 h	$\varnothing 8.0\text{mm}$ : 6000 h	$\geq \varnothing 13.0\text{mm}$ : 8000 h	$\varnothing 10.0\text{mm}$ : 8000 h		$\geq \varnothing 13.0\text{mm}$ : 10000 h	105°C 1000 hours
6.3 to 10 Vdc	16 to 35 Vdc											
$\leq \varnothing 6.0\text{mm}$ : 3000 h	$\leq \varnothing 6.0\text{mm}$ : 4000 h											
$\varnothing 8.0 - 10.0\text{mm}$ : 6000 h	$\varnothing 8.0\text{mm}$ : 6000 h											
$\geq \varnothing 13.0\text{mm}$ : 8000 h	$\varnothing 10.0\text{mm}$ : 8000 h											
	$\geq \varnothing 13.0\text{mm}$ : 10000 h											
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 will be restored at 25°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.										

### SINGLE-ENDED LEADS – Low Impedance and long life 105°C / 3000-10000 h

#### Technical data and ordering codes

Rated cap. 120 Hz 20°C ( $\mu\text{F}$ )	Case size DxL (mm)	6.3 Vdc Rated voltage - 8 Vdc Surge voltage			L.C. 20°C 2 min. ( $\mu\text{A}$ )	Arcotronics P/N
		D.F. 120 Hz 25°C (tg $\delta$ %)	Z 100 kHz 25°C ( $\Omega$ )	R.C. 100kHz 105°C ( $\text{mA}_{\text{rms}}$ )		
120	5 x 11	22	0.720	165	8	ESF127M6R3AC3AA
220	6 x 11	22	0.380	255	14	ESF227M6R3AE3AA
330	6 x 15	22	0.270	330	21	ESF337M6R3AE4AA
390	8 x 11	22	0.200	415	25	ESF397M6R3AG3AA
470	10 x 12	22	0.120	625	30	ESF477M6R3AH1AA
560	8 x 15	22	0.160	495	35	ESF567M6R3AG4AA
680	10 x 15	22	0.084	825	43	ESF687M6R3AH2AA
820	8 x 20	22	0.110	640	52	ESF827M6R3AG6AA
1200	10 x 19	22	0.062	1040	76	ESF128M6R3AH4AA
1500	10 x 25	22	0.052	1260	94	ESF158M6R3AH5AA
2200	10 x 30	22	0.044	1440	139	ESF228M6R3AH6AA
2200	13 x 20	22	0.046	1340	139	ESF228M6R3AL3AA
2700	13 x 25	22	0.034	1690	170	ESF278M6R3AL4AA
3900	13 x 30	22	0.030	1950	246	ESF398M6R3AL8AA
4700	13 x 36	22	0.027	2200	296	ESF478M6R3AL6AA
5600	13 x 40	22	0.024	2390	353	ESF568M6R3AL7AA
5600	16 x 25	22	0.028	2070	353	ESF568M6R3AM7AA
6800	16 x 32	22	0.025	2350	428	ESF688M6R3AM2AA

Rated cap. 120 Hz 20°C ( $\mu\text{F}$ )	Case size DxL (mm)	10 Vdc Rated voltage - 13 Vdc Surge voltage			L.C. 20°C 2 min. ( $\mu\text{A}$ )	Arcotronics P/N
		D.F. 120 Hz 25°C (tg $\delta$ %)	Z 100 kHz 25°C ( $\Omega$ )	R.C. 100kHz 105°C ( $\text{mA}_{\text{rms}}$ )		
82	5 x 11	19	0.720	165	8	ESF826M010AC3AA
180	6 x 11	19	0.380	255	18	ESF187M010AE3AA
270	6 x 15	19	0.270	330	27	ESF277M010AE4AA
330	8 x 11	19	0.200	415	33	ESF337M010AG3AA
390	10 x 12	19	0.120	625	39	ESF397M010AH1AA
470	8 x 15	19	0.160	495	47	ESF477M010AG4AA
680	8 x 20	19	0.110	640	68	ESF687M010AG6AA
680	10 x 15	19	0.084	825	68	ESF687M010AH2AA
1000	10 x 19	19	0.062	1040	100	ESF108M010AH4AA
1200	10 x 25	19	0.052	1260	120	ESF128M010AH5AA
1500	10 x 30	19	0.044	1440	150	ESF158M010AH6AA
1800	13 x 20	19	0.046	1340	180	ESF188M010AL3AA
2200	13 x 25	19	0.034	1690	220	ESF228M010AL4AA
2700	13 x 30	19	0.030	1950	270	ESF278M010AL8AA
3300	13 x 36	19	0.027	2200	330	ESF338M010AL6AA
3900	13 x 40	19	0.024	2390	390	ESF398M010AL7AA
3900	16 x 25	19	0.028	2070	390	ESF398M010AM7AA
5600	16 x 32	19	0.025	2350	560	ESF568M010AM2AA
6800	16 x 36	19	0.022	2550	680	ESF688M010AM3AA

### SINGLE-ENDED LEADS – Low Impedance and long life 105°C / 3000-10000 h

Rated cap. 120 Hz 20°C ( $\mu\text{F}$ )	Case size DxL (mm)	16 Vdc Rated voltage - 20 Vdc Surge voltage			L.C. 20°C 2 min. ( $\mu\text{A}$ )	Arcotronics P/N
		D.F. 120 Hz 25°C ( $\text{tg}\delta$ %)	Z 100 kHz 25°C ( $\Omega$ )	R.C. 100kHz 105°C ( $\text{mA}_{\text{rms}}$ )		
56	5 x 11	16	0.720	165	9	ESF566M016AC3AA
120	6 x 11	16	0.380	255	19	ESF127M016AE3AA
180	6 x 15	16	0.270	330	29	ESF187M016AE4AA
270	8 x 11	16	0.200	415	43	ESF277M016AG3AA
270	10 x 12	16	0.120	625	43	ESF277M016AH1AA
330	8 x 15	16	0.160	495	53	ESF337M016AG4AA
470	8 x 20	16	0.110	640	75	ESF477M016AG6AA
470	10 x 15	16	0.084	825	75	ESF477M016AH2AA
680	10 x 19	16	0.062	1040	109	ESF687M016AH4AA
820	10 x 25	16	0.052	1260	131	ESF827M016AH5AA
1200	10 x 30	16	0.044	1440	192	ESF128M016AH6AA
1200	13 x 20	16	0.046	1340	192	ESF128M016AL3AA
1500	13 x 25	16	0.034	1690	240	ESF158M016AL4AA
2200	13 x 30	16	0.030	1950	352	ESF228M016AL8AA
2700	13 x 36	16	0.027	2200	432	ESF278M016AL6AA
2700	16 x 25	16	0.028	2070	432	ESF278M016AM7AA
3300	13 x 40	16	0.024	2390	528	ESF338M016AL7AA
3900	16 x 32	16	0.025	2350	624	ESF398M016AM2AA
4700	16 x 36	16	0.022	2550	752	ESF478M016AM3AA
5600	16 x 40	16	0.018	2900	896	ESF568M016AM4AA
6800	18 x 36	16	0.021	2660	1088	ESF688M016AN2AA

Rated cap. 120 Hz 20°C ( $\mu\text{F}$ )	Case size DxL (mm)	25 Vdc Rated voltage - 32 Vdc Surge voltage			L.C. 20°C 2 min. ( $\mu\text{A}$ )	Arcotronics P/N
		D.F. 120 Hz 25°C ( $\text{tg}\delta$ %)	Z 100 kHz 25°C ( $\Omega$ )	R.C. 100kHz 105°C ( $\text{mA}_{\text{rms}}$ )		
39	5 x 11	14	0.720	165	10	ESF396M025AC3AA
82	6 x 11	14	0.380	255	20	ESF826M025AE3AA
120	6 x 15	14	0.270	330	30	ESF127M025AE4AA
150	8 x 11	14	0.200	415	37	ESF157M025AG3AA
180	10 x 12	14	0.120	625	45	ESF187M025AH1AA
220	8 x 15	14	0.160	495	55	ESF227M025AG4AA
330	8 x 20	14	0.110	640	82	ESF337M025AG6AA
330	10 x 15	14	0.084	825	82	ESF337M025AH2AA
470	10 x 19	14	0.062	1040	117	ESF477M025AH4AA
560	10 x 25	14	0.052	1260	140	ESF567M025AH5AA
820	10 x 30	14	0.044	1440	205	ESF827M025AH6AA
820	13 x 20	14	0.046	1340	205	ESF827M025AL3AA
1000	13 x 25	14	0.034	1690	250	ESF108M025AL4AA
1500	13 x 30	14	0.030	1950	375	ESF158M025AL8AA
1800	13 x 36	14	0.027	2200	450	ESF188M025AL6AA
1800	16 x 25	14	0.028	2070	450	ESF188M025AM7AA
2200	13 x 40	14	0.024	2390	550	ESF228M025AL7AA
2700	16 x 32	14	0.025	2350	675	ESF278M025AM2AA
3300	16 x 36	14	0.022	2550	825	ESF338M025AM3AA
3900	16 x 40	14	0.018	2900	975	ESF398M025AM4AA
3900	18 x 36	14	0.021	2660	975	ESF398M025AN2AA
4700	18 x 40	14	0.017	3010	1175	ESF478M025AN3AA

Rated cap. 120 Hz 20°C ( $\mu\text{F}$ )	Case size DxL (mm)	35 Vdc Rated voltage - 44 Vdc Surge voltage			L.C. 20°C 2 min. ( $\mu\text{A}$ )	Arcotronics P/N
		D.F. 120 Hz 25°C ( $\text{tg}\delta$ %)	Z 100 kHz 25°C ( $\Omega$ )	R.C. 100kHz 105°C ( $\text{mA}_{\text{rms}}$ )		
27	5 x 11	12	0.720	165	9	ESF276M035AC3AA
56	6 x 11	12	0.380	255	20	ESF566M035AE3AA
82	6 x 15	12	0.270	330	29	ESF826M035AE4AA
120	8 x 11	12	0.200	415	42	ESF127M035AG3AA
120	10 x 12	12	0.120	625	42	ESF127M035AH1AA
180	8 x 15	12	0.160	495	63	ESF187M035AG4AA
220	8 x 20	12	0.110	640	77	ESF227M035AG6AA
220	10 x 15	12	0.084	825	77	ESF227M035AH2AA
330	10 x 19	12	0.062	1040	115	ESF337M035AH4AA
390	10 x 25	12	0.052	1260	136	ESF397M035AH5AA
560	10 x 30	12	0.040	1440	196	ESF567M035AH6AA
560	13 x 20	12	0.046	1340	196	ESF567M035AL3AA
680	13 x 25	12	0.034	1690	238	ESF687M035AL4AA
1000	13 x 30	12	0.030	1950	350	ESF108M035AL8AA
1200	13 x 36	12	0.027	2200	420	ESF128M035AL6AA
1200	16 x 25	12	0.028	2070	420	ESF128M035AM7AA
1500	13 x 40	12	0.024	2390	525	ESF158M035AL7AA
1800	16 x 32	12	0.025	2350	630	ESF188M035AM2AA
2200	16 x 36	12	0.022	2550	770	ESF228M035AM3AA
2700	16 x 40	12	0.018	2900	945	ESF278M035AM4AA
2700	18 x 36	12	0.021	2660	945	ESF278M035AN2AA
3300	18 x 40	12	0.010	3010	1155	ESF338M035AN3AA

### SINGLE-ENDED LEADS – Low Impedance and long life 105°C / 8000-10000 h

#### Description

Long life 8000-10000 hours and high reliability.

#### Applications

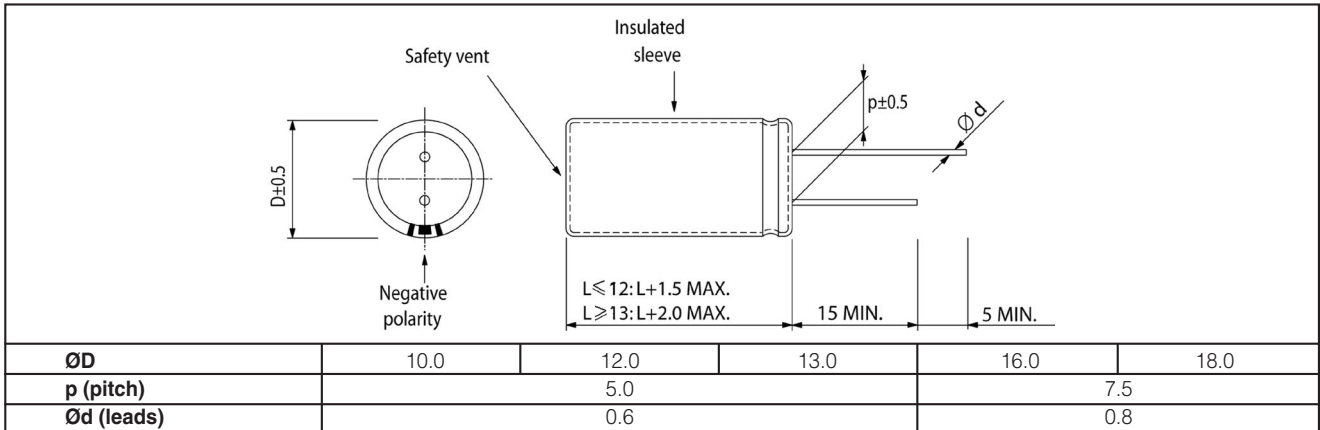
Electronic ballast and other long life equipment.

#### Features

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

Different case size available for capacitance value.

#### Diagram of dimensions (Units=mm)



#### Marking

ARCOTRONICS' logo

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

Capacitance ( $\mu$ F), Rated voltage: (Vdc),

Negative polarity: (white line), Date code

#### Electrical characteristics

Rated voltage	160 to 400 Vdc	450 Vdc
Operating temperature	-40 to +105°C	-25 to +105°C
Capacitance range	3.3 $\mu$ F to 330 $\mu$ F	
Capacitance tolerance	$\pm 20\%$ at 120Hz / 20°C	
Endurance test	8000 to 10000 h (see conditions in Test method and performance)	
Leakage current	$I = 0.04 CV (\mu A) + 100 \mu A$ $C = \text{rated capacitance } (\mu F); V = \text{rated voltage (Vdc)}$ (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)	160	200	400	450
Z (-25°C) / Z (20°C)	3	3	5	6
Z (-40°C) / Z (20°C)	6	6	6	

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

Frequency	120Hz	1KHz	10KHz	100 KHz
Multiplier factors	0.5	0.8	0.9	1.0

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

Temperature	65°C	85°C	105°C
Multiplier factors	1.7	1.4	1.0

#### Test method and performance

Conditions	Load life test	Shelf life test
Temperature: Test duration:	105°C $\varnothing 10.0$ mm: 8000 hours $\geq \varnothing 12.0$ mm: 10000 hours	105°C 1000 hours
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 will be restored at 25°C.	
Capacitance change: Dissipation factor: Leakage current:	within 20% of initial value. not exceed 200% of the initial requirement. not exceed initial requirement.	within 20% of initial value. not exceed 200% of the initial requirement. not exceed initial requirement.

### SINGLE-ENDED LEADS – Low Impedance and long life 105°C / 8000-10000 h

#### Technical data and ordering codes

Rated cap. 120 Hz 20°C ( $\mu\text{F}$ )	Case size DxL (mm)	160 Vdc Rated voltage - 200 Vdc Surge voltage				L.C. 20°C 2 min. ( $\mu\text{A}$ )	Arcotronics P/N
		D.F. 120 Hz 25°C ( $\text{tg}\delta$ %)	Z 100 kHz 25°C ( $\Omega$ )	R.C. 100kHz 105°C ( $\text{mA}_{\text{rms}}$ )			
33	10 x 19	20	1.30	500	311	ESZ336M160AH4AA	
47	10 x 19	20	0.96	580	401	ESZ476M160AH4AA	
47	13 x 20	20	0.96	660	401	ESZ476M160AL3AA	
68	12 x 25	20	0.64	720	535	ESZ686M160AK1AA	
68	16 x 20	20	0.64	760	535	ESZ686M160AM5AA	
100	13 x 25	20	0.48	970	740	ESZ107M160AL4AA	
100	16 x 20	20	0.56	1120	740	ESZ107M160AM5AA	
100	16 x 25	20	0.48	1120	740	ESZ107M160AM7AA	
100	18 x 20	20	0.56	1120	740	ESZ107M160AN4AA	
150	16 x 25	20	0.40	1200	1060	ESZ157M160AM7AA	
150	16 x 32	20	0.40	1300	1060	ESZ157M160AM2AA	
150	18 x 25	20	0.40	1300	1060	ESZ157M160AN5AA	
220	16 x 32	20	0.27	1300	1508	ESZ227M160AM2AA	
220	18 x 25	20	0.36	1300	1508	ESZ227M160AN5AA	
330	18 x 36	20	0.21	1380	2212	ESZ337M160AN2AA	

Rated cap. 120 Hz 20°C ( $\mu\text{F}$ )	Case size DxL (mm)	200 Vdc Rated voltage - 250 Vdc Surge voltage				L.C. 20°C 2 min. ( $\mu\text{A}$ )	Arcotronics P/N
		D.F. 120 Hz 25°C ( $\text{tg}\delta$ %)	Z 100 kHz 25°C ( $\Omega$ )	R.C. 100kHz 105°C ( $\text{mA}_{\text{rms}}$ )			
22	10 x 19	20	1.30	440	276	ESZ226M200AH4AA	
33	10 x 19	20	0.91	520	364	ESZ336M200AH4AA	
33	13 x 20	20	0.91	580	364	ESZ336M200AL3AA	
47	13 x 20	20	0.91	660	476	ESZ476M200AL3AA	
68	13 x 25	20	0.63	720	644	ESZ686M200AL4AA	
68	16 x 20	20	0.56	760	644	ESZ686M200AM5AA	
100	16 x 25	20	0.27	1120	900	ESZ107M200AM7AA	
150	16 x 32	20	0.22	1280	1300	ESZ157M200AM2AA	

Rated cap. 120 Hz 20°C ( $\mu\text{F}$ )	Case size DxL (mm)	400 Vdc Rated voltage - 450 Vdc Surge voltage				L.C. 20°C 2 min. ( $\mu\text{A}$ )	Arcotronics P/N
		D.F. 120 Hz 25°C ( $\text{tg}\delta$ %)	Z 100 kHz 25°C ( $\Omega$ )	R.C. 100kHz 105°C ( $\text{mA}_{\text{rms}}$ )			
2.2	10 x 15	24	8.50	50	135	ESZ225M400AH2AA	
3.3	10 x 15	24	8.30	60	153	ESZ335M400AH2AA	
4.7	10 x 15	24	5.10	100	175	ESZ475M400AH2AA	
6.8	10 x 19	24	4.80	150	209	ESZ685M400AH4AA	
10	10 x 19	24	2.90	180	260	ESZ106M400AH4AA	
22	16 x 20	24	0.95	300	452	ESZ226M400AM5AA	
33	16 x 25	24	0.91	520	628	ESZ336M400AM7AA	
47	16 x 32	24	0.68	700	852	ESZ476M400AM2AA	
68	18 x 32	24	0.63	870	1188	ESZ686M400AN1AA	

Rated cap. 120 Hz 20°C ( $\mu\text{F}$ )	Case size DxL (mm)	450 Vdc Rated voltage - 500 Vdc Surge voltage				L.C. 20°C 2 min. ( $\mu\text{A}$ )	Arcotronics P/N
		D.F. 120 Hz 25°C ( $\text{tg}\delta$ %)	Z 100 kHz 25°C ( $\Omega$ )	R.C. 100kHz 105°C ( $\text{mA}_{\text{rms}}$ )			
3.3	10 x 15	24	7.00	100	159	ESZ335M450AH2AA	
4.7	10 x 19	24	5.10	140	185	ESZ475M450AH4AA	
6.8	10 x 19	24	4.80	150	222	ESZ685M450AH4AA	
6.8	13 x 20	24	4.20	180	222	ESZ685M450AL3AA	
10	13 x 20	24	2.50	310	280	ESZ106M450AL3AA	
22	16 x 25	24	1.70	560	496	ESZ226M450AM7AA	
22	18 x 20	24	2.10	550	496	ESZ226M450AN4AA	
33	16 x 32	24	1.10	620	694	ESZ336M450AM2AA	
33	18 x 25	24	1.10	590	694	ESZ336M450AN5AA	
47	16 x 36	24	0.93	880	946	ESZ476M450AM3AA	
47	18 x 32	24	0.93	880	946	ESZ476M450AN1AA	



### SINGLE-ENDED LEADS - Low leakage current 105°C / 1000 h

#### Description

Very low leakage current.

#### Applications

Coupling, pre-amplifiers stage.

#### Features

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

#### Marking

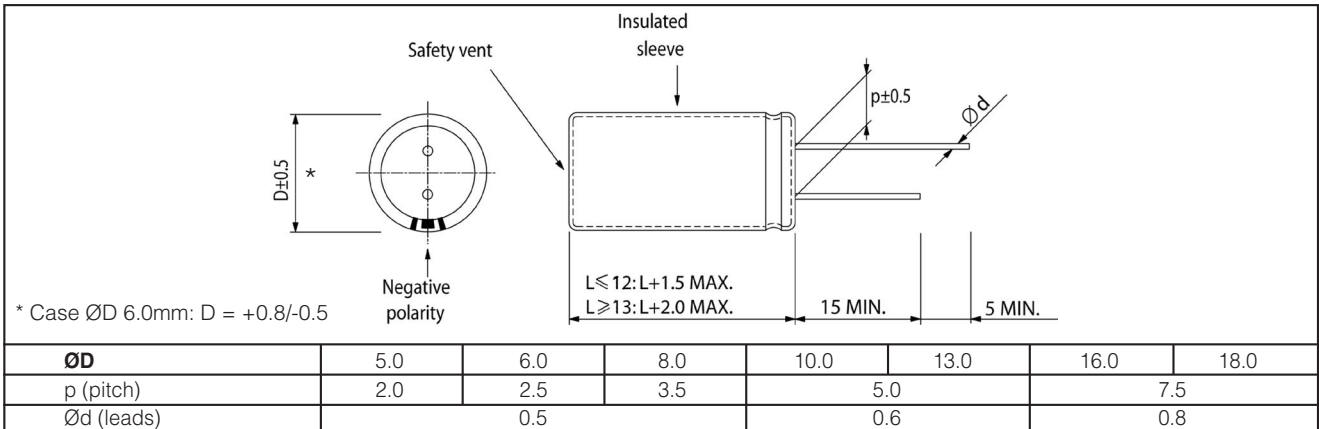
ARCOTRONICS' logo

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

Capacitance ( $\mu\text{F}$ ), Rated voltage: (Vdc),

Negative polarity: (white 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	0.1 $\mu\text{F}$ to 4700 $\mu\text{F}$
Capacitance tolerance	$\pm 20\%$ at 120Hz / 20°C
Endurance test	1000 h (see conditions in Test method and performance)
Leakage current	$I = 0.002 CV$ ( $\mu\text{A}$ ) or 0,4 $\mu\text{A}$ whichever is greater C = rated capacitance ( $\mu\text{F}$ ); 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 and 10	16 to 100
Z (-40°C) / Z (20°C)	4	3

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

Rated voltage	60 Hz	120 Hz	300 Hz	1 kHz	10 to 100 kHz
6.3 to 25 Vdc	0.85	1.00	1.04	1.08	1.19
35 to 50 Vdc	0.80	1.00	1.30	1.40	1.43
63 to 100 Vdc	0.77	1.00	1.34	1.43	1.48

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

Temperature	65°C	85°C	105°C
Multiplier factors	1.50	1.20	1.00

#### Test method and performance

Conditions	Load life test	Shelf life test
Temperature: Test duration: Ripple current:	105°C 1000 hours max ripple current at 120Hz 105°C specified in table	105°C 500 hours no ripple current applied.
Voltage:	the sum of D.C. voltage and the peak A.C. voltage must not exceed the rated voltage of capacitor.	no voltage applied.
Performance	The following specifications will be satisfied when the capacitors will be 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.

### SINGLE-ENDED LEADS - Low leakage current 105°C / 1000 h

#### Technical data and ordering codes

6.3 Vdc Rated voltage - 8 Vdc Surge voltage							
Rated cap. 120 Hz 20°C ( $\mu\text{F}$ )	Case size DxL (mm)	D.F. 120 Hz 25°C (tg $\delta$ %)	E.S.R. 1kHz 25°C ( $\Omega$ )	Z 100 kHz 25°C ( $\Omega$ )	R.C. 120 Hz 105°C ( $\text{mA}_{\text{rms}}$ )	L.C. 20°C 2 min. ( $\mu\text{A}$ )	Arcotronics P/N
68	6 x 11	18	2.00	1.50	80	0.9	ESB686M6R3AE3AA
100	6 x 11	18	1.15	0.88	126	1.3	ESB107M6R3AE3AA
150	8 x 11	18	0.77	0.59	196	1.9	ESB157M6R3AG3AA
220	10 x 12	18	0.52	0.40	272	2.8	ESB227M6R3AH1AA
330	10 x 15	18	0.34	0.26	388	4.2	ESB337M6R3AH2AA
470	10 x 19	18	0.24	0.18	507	5.9	ESB477M6R3AH4AA
680	13 x 20	18	0.16	0.12	700	8.6	ESB687M6R3AL3AA
820	13 x 25	18	0.14	0.11	850	10.3	ESB827M6R3AL4AA
1000	13 x 25	18	0.11	0.08	896	12.6	ESB108M6R3AL4AA
1500	13 x 25	18	0.07	0.05	1204	18.9	ESB158M6R3AL4AA
2200	16 x 25	18	0.06	0.04	1513	27.7	ESB228M6R3AM7AA
3300	16 x 36	18	0.04	0.04	1902	41.6	ESB338M6R3AM3AA
4700	18 x 36	18	0.03	0.02	2272	59.2	ESB478M6R3AN2AA

10 Vdc Rated voltage - 13 Vdc Surge voltage							
Rated cap. 120 Hz 20°C ( $\mu\text{F}$ )	Case size DxL (mm)	D.F. 120 Hz 25°C (tg $\delta$ %)	E.S.R. 1kHz 25°C ( $\Omega$ )	Z 100 kHz 25°C ( $\Omega$ )	R.C. 120 Hz 105°C ( $\text{mA}_{\text{rms}}$ )	L.C. 20°C 2 min. ( $\mu\text{A}$ )	Arcotronics P/N
22	5 x 11	16	5.22	4.01	68	0.4	ESB226M010AC3AA
33	6 x 11	16	3.48	2.67	78	0.7	ESB336M010AE3AA
47	6 x 11	16	2.44	1.87	106	0.9	ESB476M010AE3AA
68	6 x 11	16	1.68	1.29	142	1.4	ESB686M010AE3AA
100	8 x 11	16	1.14	0.87	179	2	ESB107M010AG3AA
150	10 x 12	16	0.76	0.58	280	3	ESB157M010AH1AA
220	10 x 15	16	0.52	0.40	355	4.4	ESB227M010AH2AA
330	10 x 19	16	0.34	0.26	480	6.6	ESB337M010AH4AA
470	13 x 20	16	0.24	0.18	640	9.4	ESB477M010AL3AA
680	13 x 20	16	0.16	0.12	848	13.6	ESB687M010AL3AA
820	13 x 25	16	0.14	0.11	980	16.4	ESB827M010AL4AA
1000	13 x 25	16	0.11	0.08	1081	20	ESB108M010AL4AA
1500	16 x 25	16	0.07	0.05	1376	30	ESB158M010AM7AA
2200	16 x 32	16	0.06	0.04	1680	44	ESB228M010AM2AA
3300	16 x 36	16	0.04	0.03	2155	66	ESB338M010AM3AA
4700	18 x 40	16	0.03	0.02	2560	94	ESB478M010AN3AA

16 Vdc Rated voltage - 20 Vdc Surge voltage							
Rated cap. 120 Hz 20°C ( $\mu\text{F}$ )	Case size DxL (mm)	D.F. 120 Hz 25°C (tg $\delta$ %)	E.S.R. 1kHz 25°C ( $\Omega$ )	Z 100 kHz 25°C ( $\Omega$ )	R.C. 120 Hz 105°C ( $\text{mA}_{\text{rms}}$ )	L.C. 20°C 2 min. ( $\mu\text{A}$ )	Arcotronics P/N
10	5 x 11	13	11.3	5.00	40	0.4	ESB106M016AC3AA
15	5 x 11	13	7.07	4.43	56	0.5	ESB156M016AC3AA
22	6 x 11	13	4.82	3.70	70	0.7	ESB226M016AE3AA
33	6 x 11	13	3.21	2.46	95	1.1	ESB336M016AE3AA
47	6 x 11	13	2.65	2.04	100	1.5	ESB476M016AE3AA
47	8 x 11	13	2.25	1.73	122	1.5	ESB476M016AG3AA
68	8 x 11	13	1.56	1.20	168	2.2	ESB686M016AG3AA
100	10 x 12	13	1.06	0.81	264	3.2	ESB107M016AH1AA
150	10 x 15	13	0.70	0.53	416	4.8	ESB157M016AH2AA
220	10 x 19	13	0.48	0.36	553	7	ESB227M016AH4AA
330	13 x 20	13	0.32	0.24	732	10.6	ESB337M016AL3AA
470	13 x 20	13	0.22	0.16	1040	15	ESB477M016AL3AA
680	13 x 25	13	0.15	0.11	1280	21.8	ESB687M016AL4AA
820	16 x 25	13	0.12	0.09	1450	26.2	ESB827M016AM7AA
1000	16 x 25	13	0.10	0.06	1700	32	ESB108M016AM7AA
1500	16 x 32	13	0.06	0.06	1750	48	ESB158M016AM2AA
2200	18 x 36	13	0.06	0.05	1900	70.4	ESB228M016AN2AA
3300	18 x 40	13	0.04	0.04	2250	105.6	ESB338M016AN3AA

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

### SINGLE-ENDED LEADS - Low leakage current 105°C / 1000 h

25 Vdc Rated voltage - 32 Vdc Surge voltage							
Rated cap. 120 Hz 20°C ( $\mu\text{F}$ )	Case size DxL (mm)	D.F. 120 Hz 25°C ( $\text{tg}\delta$ %)	E.S.R. 1kHz 25°C ( $\Omega$ )	Z 100 kHz 25°C ( $\Omega$ )	R.C. 120 Hz 105°C ( $\text{mA}_{\text{rms}}$ )	L.C. 20°C 2 min. ( $\mu\text{A}$ )	Arcotronics P/N
4.7	5 x 11	12	13.0	8.00	27	0.4	ESB475M025AC3AA
6.8	5 x 11	12	11.0	7.60	42	0.4	ESB685M025AC3AA
10	6 x 11	12	8.84	6.80	63	0.5	ESB106M025AE3AA
15	6 x 11	12	5.89	4.53	67	0.8	ESB156M025AE3AA
22	8 x 11	12	4.01	3.08	84	1.1	ESB226M025AG3AA
33	8 x 11	12	2.67	2.05	102	1.7	ESB336M025AG3AA
47	10 x 12	12	1.88	1.44	141	2.4	ESB476M025AH1AA
68	10 x 12	12	1.30	1.00	190	3.4	ESB686M025AH1AA
100	10 x 15	12	0.88	0.67	277	5	ESB107M025AH2AA
150	10 x 19	12	0.58	0.44	455	7.5	ESB157M025AH4AA
220	13 x 20	12	0.40	0.30	590	11	ESB227M025AL3AA
330	13 x 25	12	0.26	0.20	754	16.5	ESB337M025AL4AA
470	16 x 25	12	0.18	0.13	1110	23.5	ESB477M025AM7AA
680	16 x 32	12	0.12	0.09	1385	34	ESB687M025AM2AA
820	16 x 32	12	0.10	0.08	1540	41	ESB827M025AM2AA
1000	16 x 36	12	0.08	0.06	1710	50	ESB108M025AM3AA
1500	16 x 36	12	0.05	0.03	1779	75	ESB158M025AM3AA
2200	18 x 40	12	0.04	0.03	2174	110	ESB228M025AN3AA

35 Vdc Rated voltage - 44 Vdc Surge voltage							
Rated cap. 120 Hz 20°C ( $\mu\text{F}$ )	Case size DxL (mm)	D.F. 120 Hz 25°C ( $\text{tg}\delta$ %)	E.S.R. 1kHz 25°C ( $\Omega$ )	Z 100 kHz 25°C ( $\Omega$ )	R.C. 120 Hz 105°C ( $\text{mA}_{\text{rms}}$ )	L.C. 20°C 2 min. ( $\mu\text{A}$ )	Arcotronics P/N
4.7	5 x 11	10	18.8	14.4	40	0.4	ESB475M035AC3AA
6.8	5 x 11	10	13.0	10.0	45	0.5	ESB685M035AC3AA
10	6 x 11	10	8.84	6.80	67	0.7	ESB106M035AE3AA
15	8 x 11	10	5.89	4.53	75	1.1	ESB156M035AG3AA
22	8 x 11	10	4.01	3.08	97	1.5	ESB226M035AG3AA
33	10 x 12	10	2.67	2.05	139	2.3	ESB336M035AH1AA
47	10 x 12	10	1.88	1.44	166	3.3	ESB476M035AH1AA
68	10 x 15	10	1.30	1.00	238	4.8	ESB686M035AH2AA
100	10 x 19	10	0.88	0.67	310	7	ESB107M035AH4AA
150	13 x 20	10	0.58	0.44	491	10.5	ESB157M035AL3AA
220	13 x 25	10	0.40	0.30	630	15.4	ESB227M035AL4AA
330	16 x 25	10	0.26	0.20	771	23.1	ESB337M035AM7AA
470	16 x 25	10	0.18	0.15	1150	32.9	ESB477M035AM7AA
680	16 x 32	10	0.12	0.09	1462	47.6	ESB687M035AM2AA
820	16 x 36	10	0.10	0.08	1630	57.4	ESB827M035AM3AA
1000	18 x 36	10	0.08	0.06	1723	70	ESB108M035AN2AA
1500	18 x 40	10	0.05	0.03	2006	105	ESB158M035AN3AA

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

### SINGLE-ENDED LEADS - Low leakage current 105°C / 1000 h

Rated cap. 120 Hz 20°C ( $\mu\text{F}$ )	Case size DxL (mm)	50 Vdc Rated voltage - 63 Vdc Surge voltage					L.C. 20°C 2 min. ( $\mu\text{A}$ )	Arcotronics P/N
		D.F. 120 Hz 25°C ( $\text{tg}\delta$ %)	E.S.R. 1kHz 25°C ( $\Omega$ )	Z 100 kHz 25°C ( $\Omega$ )	R.C. 120 Hz 105°C ( $\text{mA}_{\text{rms}}$ )			
0.10	5 x 11	10	215	323	1	0.4	ESB104M050AC3AA	
0.15	5 x 11	10	126	270	4	0.4	ESB154M050AC3AA	
0.22	5 x 11	10	80.0	235	4	0.4	ESB224M050AC3AA	
0.33	5 x 11	10	65.2	175	6	0.4	ESB334M050AC3AA	
0.47	5 x 11	10	45.7	90.0	7	0.4	ESB474M050AC3AA	
0.56	5 x 11	10	33.0	40.0	7	0.4	ESB564M050AC3AA	
0.68	5 x 11	10	31.2	38.5	9	0.4	ESB684M050AC3AA	
1.0	5 x 11	10	25.3	32.7	18	0.4	ESB105M050AC3AA	
1.5	5 x 11	10	21.7	28.5	24	0.4	ESB155M050AC3AA	
2.2	5 x 11	10	17.5	22.4	30	0.4	ESB225M050AC3AA	
3.3	5 x 11	10	13.2	17.4	36	0.4	ESB335M050AC3AA	
4.7	6 x 11	10	9.20	12.5	45	0.5	ESB475M050AE3AA	
6.8	6 x 11	10	9.00	10.0	55	0.7	ESB685M050AE3AA	
10	8 x 11	10	8.84	6.80	82	1	ESB106M050AG3AA	
15	8 x 11	10	5.89	4.56	97	1.5	ESB156M050AG3AA	
22	10 x 12	10	4.01	3.08	127	2.2	ESB226M050AH1AA	
33	10 x 15	10	2.67	2.05	156	3.3	ESB336M050AH2AA	
47	10 x 15	10	1.88	1.44	217	4.7	ESB476M050AH2AA	
68	10 x 19	10	1.30	1.00	300	6.8	ESB686M050AH4AA	
100	13 x 20	10	0.88	0.67	390	10	ESB107M050AL3AA	
150	13 x 25	10	0.58	0.44	569	15	ESB157M050AL4AA	
220	16 x 25	10	0.40	0.30	910	22	ESB227M050AM7AA	
330	16 x 32	10	0.26	0.20	986	33	ESB337M050AM2AA	
470	16 x 36	10	0.18	0.13	1249	47	ESB477M050AM3AA	
680	16 x 36	10	0.12	0.09	1870	68	ESB687M050AM3AA	
820	16 x 36	10	0.10	0.08	1950	82	ESB827M050AM3AA	
1000	18 x 40	10	0.08	0.06	2070	100	ESB108M050AN3AA	

Rated cap. 120 Hz 20°C ( $\mu\text{F}$ )	Case size DxL (mm)	63 Vdc Rated voltage - 79 Vdc Surge voltage					L.C. 20°C 2 min. ( $\mu\text{A}$ )	Arcotronics P/N
		D.F. 120 Hz 25°C ( $\text{tg}\delta$ %)	E.S.R. 1kHz 25°C ( $\Omega$ )	Z 100 kHz 25°C ( $\Omega$ )	R.C. 120 Hz 105°C ( $\text{mA}_{\text{rms}}$ )			
0.10	5 x 11	10	204.0	306.0	1	0.4	ESB104M063AC3AA	
0.15	5 x 11	10	120.0	256.0	4	0.4	ESB154M063AC3AA	
0.22	5 x 11	10	76.0	223.0	4	0.4	ESB224M063AC3AA	
0.33	5 x 11	10	61.9	166.0	6	0.4	ESB334M063AC3AA	
0.47	5 x 11	10	43.4	85.5	7	0.4	ESB474M063AC3AA	
0.56	5 x 11	10	31.3	38.0	7	0.4	ESB564M063AC3AA	
0.68	5 x 11	10	29.6	36.5	9	0.4	ESB684M063AC3AA	
1.0	5 x 11	10	24.0	31.0	18	0.4	ESB105M063AC3AA	
1.5	5 x 11	10	20.6	27.0	24	0.4	ESB155M063AC3AA	
2.2	5 x 11	10	16.6	21.2	30	0.4	ESB225M063AC3AA	
3.3	5 x 11	10	12.5	16.5	36	0.4	ESB335M063AC3AA	
4.7	6 x 11	10	8.74	11.8	45	0.6	ESB475M063AE3AA	
6.8	6 x 11	10	8.55	9.50	55	0.9	ESB685M063AE3AA	
10	8 x 11	10	8.39	6.46	82	1.3	ESB106M063AG3AA	
15	10 x 12	10	5.59	4.30	103	1.9	ESB156M063AH1AA	
22	10 x 15	10	3.80	2.92	178	2.8	ESB226M063AH2AA	
33	10 x 15	10	2.53	1.94	210	4.2	ESB336M063AH2AA	
47	10 x 19	10	1.78	1.36	240	5.9	ESB476M063AH4AA	
68	10 x 19	10	1.23	0.95	328	8.6	ESB686M063AH4AA	
100	13 x 25	10	0.83	0.63	420	12.6	ESB107M063AL4AA	
150	13 x 25	10	0.55	0.41	648	18.9	ESB157M063AL4AA	
220	16 x 32	10	0.38	0.28	930	27.7	ESB227M063AM2AA	
330	16 x 36	10	0.24	0.19	1088	41.6	ESB337M063AM3AA	
470	18 x 36	10	0.17	0.12	1385	59.2	ESB477M063AN2AA	
680	18 x 36	10	0.11	0.08	1870	85.7	ESB687M063AN2AA	
820	18 x 40	10	0.10	0.08	1950	103.3	ESB827M063AN3AA	

### SINGLE-ENDED LEADS - Low leakage current 105°C / 1000 h

80 Vdc Rated voltage - 100 Vdc Surge voltage							
Rated cap. 120 Hz 20°C ( $\mu\text{F}$ )	Case size DxL (mm)	D.F. 120 Hz 25°C ( $\text{tg}\delta$ %)	E.S.R. 1kHz 25°C ( $\Omega$ )	Z 100 kHz 25°C ( $\Omega$ )	R.C. 120 Hz 105°C ( $\text{mA}_{\text{rms}}$ )	L.C. 20°C 2 min. ( $\mu\text{A}$ )	Arcotronics P/N
0.10	5 x 11	10	193.0	290.0	1	0.4	ESB104M080AC3AA
0.15	5 x 11	10	113.0	243.0	4	0.4	ESB154M080AC3AA
0.22	5 x 11	10	72.0	211.0	4	0.4	ESB224M080AC3AA
0.33	5 x 11	10	58.6	157.0	6	0.4	ESB334M080AC3AA
0.47	5 x 11	10	41.1	81.0	7	0.4	ESB474M080AC3AA
0.56	5 x 11	10	29.7	36.0	7	0.4	ESB564M080AC3AA
0.68	5 x 11	10	28.0	34.6	9	0.4	ESB684M080AC3AA
1.0	5 x 11	10	22.7	29.4	18	0.4	ESB105M080AC3AA
1.5	5 x 11	10	19.5	25.6	24	0.4	ESB155M080AC3AA
2.2	5 x 11	10	15.7	20.1	30	0.4	ESB225M080AC3AA
3.3	6 x 11	10	11.8	15.6	36	0.5	ESB335M080AE3AA
4.7	6 x 11	10	8.28	11.2	45	0.8	ESB475M080AE3AA
6.8	8 x 11	10	8.10	9.00	60	1.1	ESB685M080AG3AA
10	10 x 12	10	7.95	6.12	90	1.6	ESB106M080AH1AA
15	10 x 15	10	5.30	4.07	112	2.4	ESB156M080AH2AA
22	10 x 15	10	3.60	2.77	165	3.5	ESB226M080AH2AA
33	10 x 19	10	2.40	1.84	217	5.3	ESB336M080AH4AA
47	10 x 19	10	1.69	1.29	276	7.5	ESB476M080AH4AA
68	13 x 20	10	1.17	0.90	361	10.9	ESB686M080AL3AA
100	13 x 25	10	0.79	0.68	447	16	ESB107M080AL4AA
150	16 x 25	10	0.52	0.39	663	24	ESB157M080AM7AA
220	16 x 32	10	0.36	0.27	970	35.2	ESB227M080AM2AA
330	16 x 36	10	0.23	0.18	1198	52.8	ESB337M080AM3AA
470	18 x 36	10	0.16	0.11	1509	75.2	ESB477M080AN2AA

100 Vdc Rated voltage - 125 Vdc Surge voltage							
Rated cap. 120 Hz 20°C ( $\mu\text{F}$ )	Case size DxL (mm)	D.F. 120 Hz 25°C ( $\text{tg}\delta$ %)	E.S.R. 1kHz 25°C ( $\Omega$ )	Z 100 kHz 25°C ( $\Omega$ )	R.C. 120 Hz 105°C ( $\text{mA}_{\text{rms}}$ )	L.C. 20°C 2 min. ( $\mu\text{A}$ )	Arcotronics P/N
0.10	5 x 11	10	182.0	274.0	1	0.4	ESB104M100AC3AA
0.15	5 x 11	10	107.0	229.0	4	0.4	ESB154M100AC3AA
0.22	5 x 11	10	68.0	199.0	4	0.4	ESB224M100AC3AA
0.33	5 x 11	10	55.4	148.0	6	0.4	ESB334M100AC3AA
0.47	5 x 11	10	38.8	76.5	7	0.4	ESB474M100AC3AA
0.56	5 x 11	10	28.0	34.0	7	0.4	ESB564M100AC3AA
0.68	5 x 11	10	26.5	32.7	9	0.4	ESB684M100AC3AA
1.0	5 x 11	10	21.5	27.7	18	0.4	ESB105M100AC3AA
1.5	5 x 11	10	18.4	24.2	24	0.4	ESB155M100AC3AA
2.2	6 x 11	10	14.8	19.3	30	0.4	ESB225M100AE3AA
3.3	8 x 11	10	11.2	14.7	36	0.7	ESB335M100AG3AA
4.7	8 x 11	10	7.82	10.6	60	0.9	ESB475M100AG3AA
6.8	10 x 12	10	7.65	8.50	67	1.4	ESB685M100AH1AA
10	10 x 15	10	7.51	5.78	94	2	ESB106M100AH2AA
15	10 x 19	10	5.00	3.85	117	3	ESB156M100AH4AA
22	10 x 19	10	3.40	2.61	187	4.4	ESB226M100AH4AA
33	13 x 20	10	2.26	1.74	225	6.6	ESB336M100AL3AA
47	13 x 25	10	1.59	1.22	285	9.4	ESB476M100AL4AA
68	13 x 25	10	1.10	0.85	375	13.6	ESB686M100AL4AA
100	16 x 25	10	0.74	0.56	456	20	ESB107M100AM7AA
150	16 x 32	10	0.49	0.37	707	30	ESB157M100AM2AA
220	18 x 36	10	0.34	0.25	1010	44	ESB227M100AN2AA
330	18 x 40	10	0.22	0.17	1377	66	ESB337M100AN3AA

### SINGLE-ENDED LEADS - Bi-polar 105°C / 1000 h

#### Description

Bi-polar miniature type.

#### Applications

To be used with reversing polarity.

#### Features

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

#### Marking

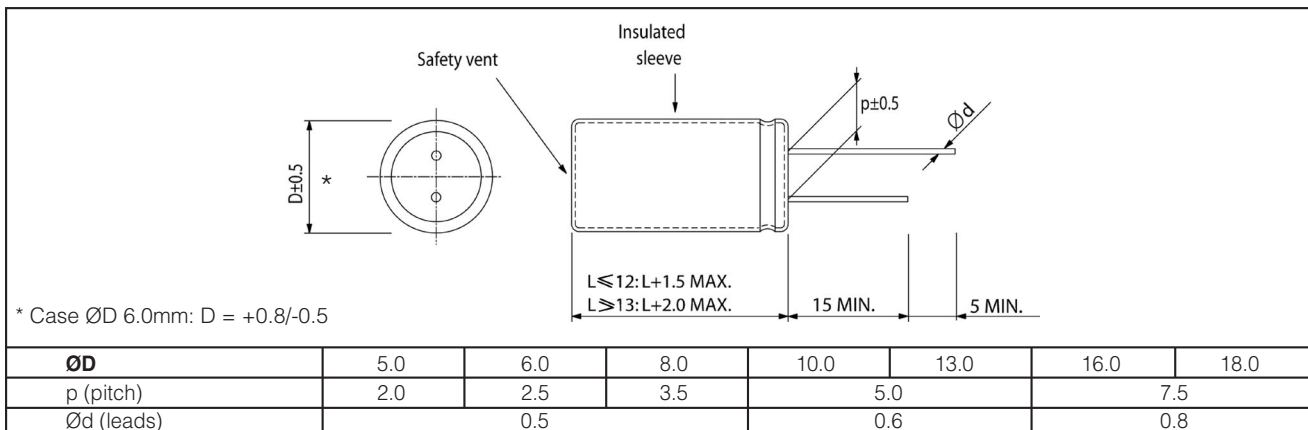
ARCOTRONICS' logo

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

Rated capacitance ( $\mu\text{F}$ ), Rated voltage: (Vdc),

Date code.

#### Diagram of dimensions (Units=mm)



#### Electrical characteristics

Rated voltage	6.3 to 100 Vdc
Operating temperature	-40 to +105°C
Capacitance range	0.47 $\mu\text{F}$ to 2200 $\mu\text{F}$
Capacitance tolerance	$\pm 20\%$ at 120Hz / 20°C
Endurance test	1000 h (see conditions in Test method and performance)
Leakage current	$I = 0.03 CV (\mu\text{A}) + 3\mu\text{A}$ $C = \text{rated capacitance } (\mu\text{F}); V = \text{rated voltage (Vdc)}$ (after than D.C. rated working voltage at 20°C has been applied for 5 min)

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

Frequency	60 Hz	120 Hz	300 Hz	1 kHz	10 to 100 kHz
Multiplier factors	0.75	1.00	1.20	1.32	1.65

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

Temperature	65°C	85°C	105°C
Multiplier factors	1.30	1.20	1.00

#### Test method and performance

Conditions	Load life test	Shelf life test
Temperature: Test duration: Ripple current:	105°C 1000 hours with the polarity inverted every 250 hours max ripple current at 120 Hz 105°C specified in table	105°C 500 hours no ripple current applied.
Voltage:	the sum of D.C. voltage and the peak A.C. voltage must not exceed the rated voltage of capacitor.	no voltage applied.
Performance	The following specifications will be satisfied when the capacitors will be restored at 20°C.	
Capacitance change: Dissipation factor: Leakage current:	within 25% of initial value. not exceed 150% of the initial requirement. not exceed initial requirement.	within 25% of initial value. not exceed 200% of the initial requirement. not exceed initial requirement.

### SINGLE-ENDED LEADS - Bi-polar 105°C / 1000 h

#### 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 %)	R.C. 120 Hz 105°C (mA <sub>rms</sub> )	L.C. 20°C 5 min. (μA)	Arcotronics P/N
33	5 x 11	24	63	9	ESN336M6R3AC3AA
47	6 x 11	24	84	12	ESN476M6R3AE3AA
100	8 x 11	24	140	22	ESN107M6R3AG3AA
220	10 x 12	24	235	45	ESN227M6R3AH1AA
330	10 x 15	24	310	65	ESN337M6R3AH2AA
470	10 x 19	24	400	92	ESN477M6R3AH4AA
1000	13 x 25	24	690	192	ESN108M6R3AL4AA
2200	16 x 32	24	1250	419	ESN228M6R3AM2AA

10 Vdc Rated voltage - 13 Vdc Surge voltage					
Rated cap. 120 Hz 20°C (μF)	Case size DxL (mm)	D.F. 120 Hz 25°C (tgδ %)	R.C. 120 Hz 105°C (mA <sub>rms</sub> )	L.C. 20°C 5 min. (μA)	Arcotronics P/N
22	5 x 11	20	57	10	ESN226M010AC3AA
33	6 x 11	20	77	12	ESN336M010AE3AA
47	6 x 11	20	93	17	ESN476M010AE3AA
100	8 x 11	20	193	33	ESN107M010AG3AA
220	10 x 15	20	255	69	ESN227M010AH2AA
330	10 x 19	20	380	102	ESN337M010AH4AA
470	13 x 20	20	470	144	ESN477M010AL3AA
1000	16 x 25	20	885	303	ESN108M010AM7AA
2200	16 x 36	20	1450	663	ESN228M010AM3AA

16 Vdc Rated voltage - 20 Vdc Surge voltage					
Rated cap. 120 Hz 20°C (μF)	Case size DxL (mm)	D.F. 120 Hz 25°C (tgδ %)	R.C. 120 Hz 105°C (mA <sub>rms</sub> )	L.C. 20°C 5 min. (μA)	Arcotronics P/N
10	6 x 11	17	42	8	ESN106M016AE3AA
22	5 x 11	17	59	14	ESN226M016AC3AA
22	6 x 11	17	69	14	ESN226M016AE3AA
33	8 x 11	17	98	19	ESN336M016AG3AA
47	8 x 11	17	115	26	ESN476M016AG3AA
100	10 x 12	17	175	51	ESN107M016AH1AA
100	10 x 15	17	205	51	ESN107M016AH2AA
220	10 x 19	17	330	109	ESN227M016AH4AA
330	13 x 20	17	445	161	ESN337M016AL3AA
470	13 x 25	17	570	229	ESN477M016AL4AA
1000	16 x 32	17	1020	483	ESN108M016AM2AA

25 Vdc Rated voltage - 32 Vdc Surge voltage					
Rated cap. 120 Hz 20°C (μF)	Case size DxL (mm)	D.F. 120 Hz 25°C (tgδ %)	R.C. 120 Hz 105°C (mA <sub>rms</sub> )	L.C. 20°C 5 min. (μA)	Arcotronics P/N
10	5 x 11	15	42	10	ESN106M025AC3AA
10	6 x 11	15	50	10	ESN106M025AE3AA
22	6 x 11	15	69	19	ESN226M025AE3AA
22	8 x 11	15	86	19	ESN226M025AG3AA
33	8 x 11	15	105	28	ESN336M025AG3AA
47	10 x 12	15	140	38	ESN476M025AH1AA
100	10 x 19	15	240	78	ESN107M025AH4AA
220	13 x 20	15	390	168	ESN227M025AL3AA
330	16 x 25	15	580	250	ESN337M025AM7AA
470	16 x 25	15	690	355	ESN477M025AM7AA

35 Vdc Rated voltage - 44 Vdc Surge voltage					
Rated cap. 120 Hz 20°C (μF)	Case size DxL (mm)	D.F. 120 Hz 25°C (tgδ %)	R.C. 120 Hz 105°C (mA <sub>rms</sub> )	L.C. 20°C 5 min. (μA)	Arcotronics P/N
4.7	5 x 11	14	34	8	ESN475M035AC3AA
10	6 x 11	14	54	13	ESN106M035AE3AA
22	8 x 11	14	94	26	ESN226M035AG3AA
33	10 x 12	14	125	38	ESN336M035AH1AA
47	10 x 15	14	165	52	ESN476M035AH2AA
100	13 x 20	14	285	108	ESN107M035AL3AA
220	16 x 25	14	520	234	ESN227M035AM7AA
330	16 x 25	14	630	349	ESN337M035AM7AA
470	16 x 32	14	820	496	ESN477M035AM2AA

50 Vdc Rated voltage - 63 Vdc Surge voltage					
Rated cap. 120 Hz 20°C (μF)	Case size DxL (mm)	D.F. 120 Hz 25°C (tgδ %)	R.C. 120 Hz 105°C (mA <sub>rms</sub> )	L.C. 20°C 5 min. (μA)	Arcotronics P/N
0.47	5 x 11	12	11	4	ESN474M050AC3AA
1.0	5 x 11	12	17	5	ESN105M050AC3AA
2.2	5 x 11	12	25	6	ESN225M050AC3AA
3.3	6 x 11	12	31	8	ESN335M050AE3AA
4.7	5 x 11	12	34	10	ESN475M050AC3AA
4.7	6 x 11	12	41	10	ESN475M050AE3AA
10	6 x 11	12	56	18	ESN106M050AE3AA
10	8 x 11	12	70	18	ESN106M050AG3AA
22	8 x 11	12	97	36	ESN226M050AG3AA
22	10 x 12	12	115	36	ESN226M050AH1AA
33	10 x 15	12	150	52	ESN336M050AH2AA
47	10 x 19	12	190	73	ESN476M050AH4AA
100	13 x 20	12	310	153	ESN107M050AL3AA
220	16 x 25	12	570	333	ESN227M050AM7AA
330	16 x 36	12	790	498	ESN337M050AM3AA

63 Vdc Rated voltage - 79 Vdc Surge voltage					
Rated cap. 120 Hz 20°C (μF)	Case size DxL (mm)	D.F. 120 Hz 25°C (tgδ %)	R.C. 120 Hz 105°C (mA <sub>rms</sub> )	L.C. 20°C 5 min. (μA)	Arcotronics P/N
0.47	5 x 11	10	11	4	ESN474M063AC3AA
1.0	5 x 11	10	17	5	ESN105M063AC3AA
2.2	5 x 11	10	25	7	ESN225M063AC3AA
3.3	6 x 11	10	37	9	ESN335M063AE3AA
4.7	5 x 11	10	37	12	ESN475M063AC3AA
4.7	6 x 11	10	44	12	ESN475M063AE3AA
10	8 x 11	10	74	22	ESN106M063AG3AA
22	10 x 15	10	130	45	ESN226M063AH2AA
33	10 x 19	10	175	65	ESN336M063AH4AA
47	13 x 20	10	230	92	ESN476M063AL3AA
100	16 x 25	10	410	192	ESN107M063AM7AA
220	16 x 32	10	660	419	ESN227M063AM2AA

80 Vdc Rated voltage - 100 Vdc Surge voltage					
Rated cap. 120 Hz 20°C (μF)	Case size DxL (mm)	D.F. 120 Hz 25°C (tgδ %)	R.C. 120 Hz 105°C (mA <sub>rms</sub> )	L.C. 20°C 5 min. (μA)	Arcotronics P/N
0.47	5 x 11	10	11	4	ESN474M080AC3AA
1.0	5 x 11	10	17	5	ESN105M080AC3AA
2.2	5 x 11	10	29	8	ESN225M080AC3AA
3.3	6 x 11	10	39	11	ESN335M080AE3AA
4.7	8 x 11	10	47	14	ESN475M080AG3AA
10	10 x 12	10	88	27	ESN106M080AH1AA
22	10 x 19	10	150	56	ESN226M080AH4AA
33	13 x 20	10	205	82	ESN336M080AL3AA
47	13 x 20	10	245	116	ESN476M080AL3AA
100	16 x 25	10	435	243	ESN107M080AM7AA

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

### SINGLE-ENDED LEADS - Bi-polar 105°C / 1000 h

100 Vdc Rated voltage - 125 Vdc Surge voltage					
Rated cap. 120 Hz 20°C ( $\mu$ F)	Case size DxL (mm)	D.F. 120 Hz 25°C (tg $\delta$ %)	R.C. 120 Hz 105°C (mA <sub>rms</sub> )	L.C. 20°C 5 min. ( $\mu$ A)	Arcotronics P/N
0.47	5 x 11	10	14	5	ESN474M100AC3AA
1.0	5 x 11	10	21	6	ESN105M100AC3AA
2.2	6 x 11	10	34	10	ESN225M100AE3AA
3.3	8 x 11	10	49	13	ESN335M100AG3AA
4.7	8 x 11	10	58	17	ESN475M100AG3AA
10	8 x 11	10	80	33	ESN106M100AG3AA
10	10 x 12	10	100	33	ESN106M100AH1AA
22	13 x 20	10	180	69	ESN226M100AL3AA
33	13 x 20	10	220	102	ESN336M100AL3AA
47	13 x 25	10	285	144	ESN476M100AL4AA
100	16 x 32	10	510	303	ESN107M100AM2AA



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