

Resin-Dipped Type Tantalum Solid Electrolytic Capacitors

Series: **EF**

Type: **F** (Resin-Dipped Type)



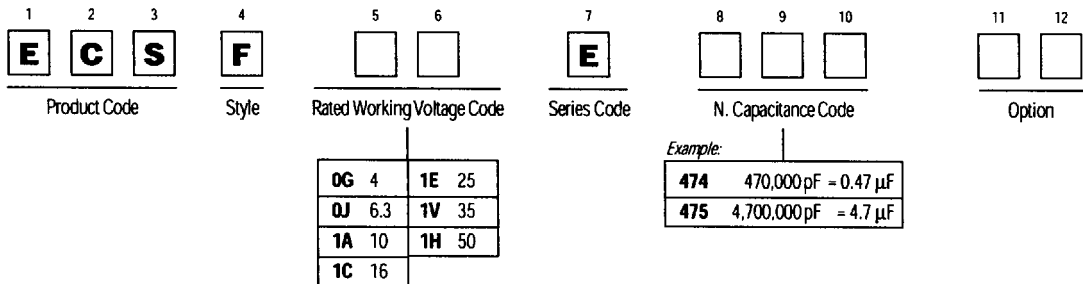
■ Features

- Compact size and wide capacitance range
- Excellent frequency and temperature characteristics
- Available for direct mounting on thin circuit boards
- Washable in organic solvents after soldering
- IEC pub. 384-15 approved

■ Recommended Applications

- Television, audio, and compact-size electronic equipment

■ Explanation of Part Numbers



■ Specifications

Operating temperature range	-55 to +85 °C (W.V. ≥10 V.DC -55 to +105 °C)
Rated working voltage	4 to 50 V DC
Nominal capacitance range	0.1 to 220 μF
Capacitance tolerance	+20%, (120 Hz/+20 °C)
DC leakage current	I ≤ 0.008 CV or 0.05 (μA) after 2 minutes application of rated working voltage at +20 °C (whichever greater)
tan δ	≤ 1 μF 0.04 max. ≤ 1.5 to 68 μF 0.06 max. ≥ 100 μF 0.08 max.

Moisture resistance: After 500 hours exposure at +40 °C and 90 to 95% R.H. without load, the capacitor shall meet the following limits:

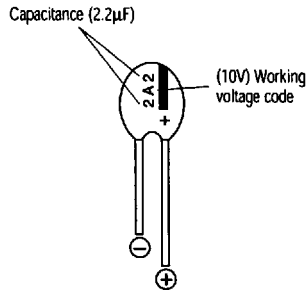
Capacitance change	± 10% of initial measured value
tan δ	≤ 150% of initial specified value
DC leakage current	0.012 CV or 0.75 (μA) max., whichever greater

Endurance: After 2,000 hours application of rated DC working voltage at +105 °C with derated voltage for 10 to 50 W.V., the capacitor shall meet the following limits:

Capacitance change	± 10% of initial measured value
tan δ	≤ initial specified value
DC leakage current	0.01 CV or 0.625 (μA) max., whichever greater

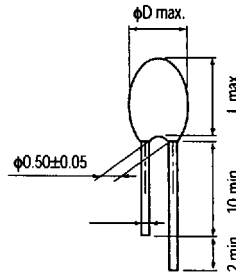
■ Marking

For straight-lead products under size codes A-C, some (products with the • in case size table) will have the markings below the voltage (10V) code. This also represents a decimal point.



W.V. (V)	W. V. code
4	G
6.3	J
10	A
16	C
25	E
35	V
50	H

■ Dimensions in mm (not to scale)



Size Code	φD	L	F
A	3.3	5.0	2.5±0.5
B	3.3	5.5	2.5±0.5
C	3.5	5.5	2.5±0.5
D	3.7	6.5	2.5±0.5
E	4.0	7.0	2.5 ^{+1.0} _{-0.5}
F	4.5	7.0	2.5 ^{+1.0} _{-0.5}
G	4.7	8.0	2.5 ^{+1.0} _{-0.5}
H	5.2	8.5	2.5 ^{+1.0} _{-0.5}
I	5.5	9.5	2.5 ^{+1.0} _{-0.5}
J	6.0	11.0	2.5 ^{+1.0} _{-0.5}
K	7.5	12.5	5.0±0.5

■ Case Size

Capacitance (µF)	Working Voltage (V DC)						
	4 (0G)	6.3 (0J)	10 (1A)	16 (1C)	25 (1E)	35 (1V)	50 (1H)
0.10 (104)						•A	•A
0.15 (154)						•A	•A
0.22 (224)						•A	•B
0.33 (334)						•B	•C
0.47 (474)						•B	D
0.68 (684)						•B	D
1.0 (105)				•A	•B	C	E
1.5 (155)				•B	C	C	F
2.2 (225)			•B	•C	C	D	G
3.3 (335)			•C	C	D	E	H
4.7 (475)		•C	C	D	E	F	I
6.8 (685)	•C	C	D	E	F	H	
10 (106)	C	D	E	F	H	I	
15 (156)	D	E	F	G	I	J	
22 (226)	E	F	G	H	J	K	
33 (336)	F	G	H	I	K		
47 (476)	G	H	I	J			
68 (686)	H	I	J	K			
100 (107)	I	J	K				
150 (157)	J	K					
220 (227)	K						

- () shows W.V. and capacitance code.
- Products designated by (•) have the voltage code on body.
- When selecting W.V., see page ••.

Series: **EF**
 Type: **F (Resin Dipped Type)**

Resin Dipped Type Tantalum Solid Electrolytic Capacitors

Japan



■ Features

- Compact size and wide capacitance range
- Excellent frequency and temperature characteristics
- Available for direct mounting on thin circuit boards
- Washable in organic solvents after soldering
- IEC pub. 384-15 approved

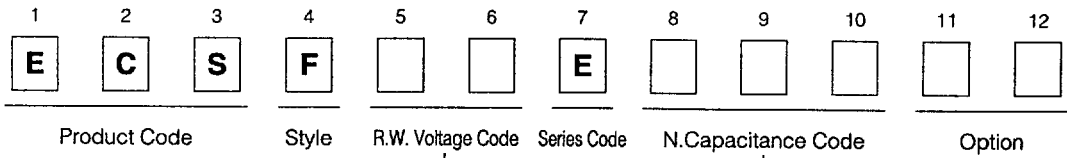
■ Recommended Applications

- TV, Audio, Compact size electronic equipment

■ Specifications

Operating Temp. Range	-55 to +85 °C (W.V. ≥ 10 V.DC -55 to +105 °C)							
Rated W.V. Range	4 to 50 V.DC							
Nominal Cap. Range	0.1 to 220 μF							
Capacitance Tolerance	±20 %, (120 Hz/+20 °C)							
DC Leakage Current	I ≤ 0.008 CV or 0.05 (μA) after 2 minutes application of rated working voltage at +20 °C (Whichever, greater)							
tan δ	≤ 1 μF 0.04 max. 1.5 to 68 μF 0.06 max. ≥ 100 μF 0.08 max.	4 W.V. 0.1 max. (120 Hz/+20 °C)						
Moisture Resistance	After 500 hours exposure at +40 °C and 90 to 95 % R.H. without load, the capacitor shall meet the following limits. <table border="1" style="margin-left: 40px;"> <tr> <td>Capacitance change</td> <td>±10 % of initial measured value</td> </tr> <tr> <td>tan δ</td> <td>≤ 150 % of initial specified value</td> </tr> <tr> <td>DC leakage current</td> <td>0.012 CV or 0.75 (μA) max. whichever, greater</td> </tr> </table>		Capacitance change	±10 % of initial measured value	tan δ	≤ 150 % of initial specified value	DC leakage current	0.012 CV or 0.75 (μA) max. whichever, greater
Capacitance change	±10 % of initial measured value							
tan δ	≤ 150 % of initial specified value							
DC leakage current	0.012 CV or 0.75 (μA) max. whichever, greater							
Endurance	After 2000 hours application of rated DC working voltage at +85 °C or 1000 hours at +105 °C with derated voltage for 10 to 50 W.V., the capacitor shall meet the following limits. <table border="1" style="margin-left: 40px;"> <tr> <td>Capacitance change</td> <td>±10 % of initial measured value</td> </tr> <tr> <td>tan δ</td> <td>≤ Initial specified value</td> </tr> <tr> <td>DC leakage current</td> <td>0.01 CV or 0.625 (μA) max. whichever, greater</td> </tr> </table>		Capacitance change	±10 % of initial measured value	tan δ	≤ Initial specified value	DC leakage current	0.01 CV or 0.625 (μA) max. whichever, greater
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tan δ	≤ Initial specified value							
DC leakage current	0.01 CV or 0.625 (μA) max. whichever, greater							

Explanation of Part Numbers



W.V. code	0G	0J	1A	1C	1E	1V	1H
W.V.(V)	4	6.3	10	16	25	35	50

Example:

Capacitance code	Capacitance
474	470000 pF=0.47 μF
475	4700000 pF=4.7 μF

Marking

For straight-lead products under size codes A-C, some will have the markings below (products with ● in size table) Voltage (10 V) code and this also represents a decimal point.

W.V. (V)	W.V. code
4	G
6.3	J
10	A
16	C
25	E
35	V
50	H

* (for 6.3 W.V. abbreviated to 6)

Dimensions in mm (not to scale)

Straight-lead-products

Size code	φD	L	F
A	3.3	5.0	2.5±0.5
B	3.3	5.5	2.5±0.5
C	3.5	5.5	2.5±0.5
D	3.7	6.5	2.5±0.5
E	4.0	7.0	2.5 ^{+1.0} _{-0.5}
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H	5.2	8.5	2.5 ^{+1.0} _{-0.5}
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J	6.0	11.0	2.5 ^{+1.0} _{-0.5}
K	7.5	12.5	5.0±0.5

Case size

Cap.(μF)	W.V.(V.DC)	4 (0G)	6.3 (0J)	10 (1A)	16 (1C)	25 (1E)	35 (1V)	50 (1H)
0.10 (104)							● A	● A
0.15 (154)							● A	● A
0.22 (224)							● A	● B
0.33 (334)							● A	● C
0.47 (474)							● B	D
0.68 (684)							● B	D
1.0 (105)					● A	● B	C	E
1.5 (155)					● B	C	C	F
2.2 (225)				● B	● C	C	D	G
3.3 (335)				● C	C	D	E	H
4.7 (475)			● C	C	D	E	F	I
6.8 (685)		● C	C	D	E	F	H	
10 (106)		C	D	E	F	H	I	
15 (156)		D	E	F	G	I	J	
22 (226)		E	F	G	H	J	K	
33 (336)		F	G	H	I	K		
47 (476)		G	H	I	J			
68 (686)		H	I	J	K			
100 (107)		I	J	K				
150 (157)		J	K					
220 (227)		K						

Note: 1. () shows W.V. and capacitance code.
 2. Products designated by (●) have the voltage code on the body.
 3. When selecting W.V., see the page 153.