

FS Series

The FS series Super Capacitors are ideal as short-time (30 minutes max.) backup devices in small and lightweight systems. 5.5 VDC (0.022 F to 1.0 F), 11 VDC (0.47 F and 1.0 F only) and 12 VDC (1.0 F and 5.0 F only)

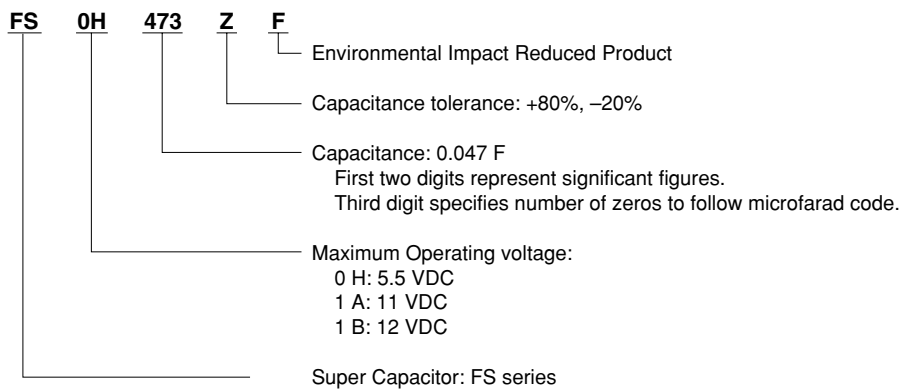
Features

- Ideal for supplying current of several hundred μ A to several mA for short time

Applications

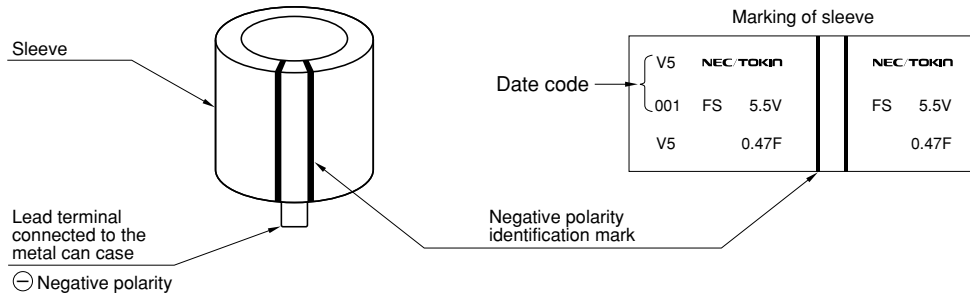
- Backup source for microcomputers and buffer for momentary high-current loads (for example, motors)

Part Number System

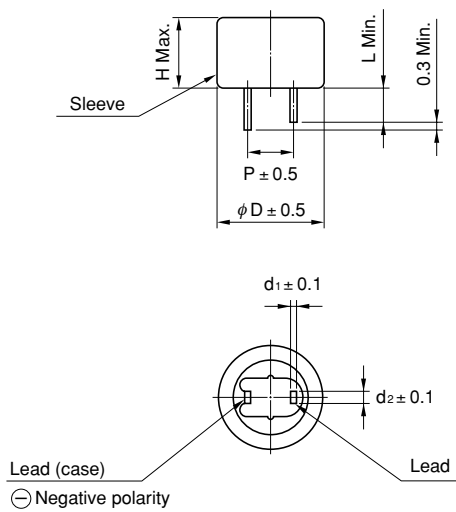


- All specifications in this catalog and production status of products are subject to change without notice. Prior to the purchase, please contact NEC TOKIN for updated product data.
- Please request for a specification sheet for detailed product data prior to the purchase.
- Before using the product in this catalog, please read "Precautions" and other safety precautions listed in the printed version catalog.

Markings



Dimensions



Part No.	Dimensions mm (inch)						Weight g (oz)
	D	H	P	d ₁	d ₂	L	
FS0H223ZF	11.5 (0.453)	8.5 (0.335)	5.08 (0.200)	0.4 (0.016)	1.2 (0.047)	2.7 (0.106)	1.6 (0.057)
FS0H473ZF	13.0 (0.512)	8.5 (0.335)	5.08 (0.200)	0.4 (0.016)	1.2 (0.047)	2.2 (0.087)	2.6 (0.092)
FS0H104ZF	16.5 (0.650)	8.5 (0.335)	5.08 (0.200)	0.4 (0.016)	1.2 (0.047)	2.7 (0.106)	4.1 (0.145)
FS0H224ZF	16.5 (0.650)	13.0 (0.512)	5.08 (0.200)	0.4 (0.016)	1.2 (0.047)	2.7 (0.106)	5.3 (0.187)
FS0H474ZF	21.5 (0.846)	13.0 (0.512)	7.62 (0.300)	0.6 (0.024)	1.2 (0.047)	3.0 (0.118)	10 (0.353)
FS0H105ZF	28.5 (1.122)	14.0 (0.551)	10.16 (0.400)	0.6 (0.024)	1.4 (0.055)	6.1 (0.240)	18 (0.635)
FS1A474ZF	28.5 (1.122)	25.5 (1.004)	10.16 (0.400)	0.6 (0.024)	1.4 (0.055)	6.1 (0.240)	32.0 (1.129)
FS1A105ZF	28.5 (1.122)	31.5 (1.240)	10.16 (0.400)	0.6 (0.024)	1.4 (0.055)	6.1 (0.240)	35.0 (1.235)
FS1B105ZF	28.5 (1.122)	38.0 (1.496)	10.16 (0.400)	0.6 (0.024)	1.4 (0.055)	6.1 (0.240)	40 (1.411)
FS1B505ZF	44.8 (1.764)	60.0 (2.361)	20.0 (0.787)	1.0 (0.040)	1.4 (0.055)	9.5 (0.240)	160 (5.644)

Note: Weight is typical.

Standard Ratings

Part Number	Max. Operating Voltage (V)	Nominal Capacitance		Max. ESR (at 1 kHz) (Ω)	Max. Current at 30 minutes (at 1 kHz) (mA)
		Charge System (F)	Discharge System (F)		
FS0H223ZF	5.5	0.022	0.033	60	0.033
FS0H473ZF	5.5	0.047	0.072	40	0.071
FS0H104ZF	5.5	0.10	0.15	25	0.15
FS0H224ZF	5.5	0.22	0.33	25	0.33
FS0H474ZF	5.5	0.47	0.75	13	0.71
FS0H105ZF	5.5	1.0	1.3	7	1.5
FS1A474ZF	11.0	0.47	0.60	7	1.41
FS1A105ZF	11.0	1.0	1.3	7	3.0
FS1B105ZF	12.0	1.0	1.3	7.5	3.6
FS1B505ZF	12.0	5.0	6.5	4.0	18.0



- All specifications in this catalog and production status of products are subject to change without notice. Prior to the purchase, please contact NEC TOKIN for updated product data.
- Please request for a specification sheet for detailed product data prior to the purchase.
- Before using the product in this catalog, please read "Precautions" and other safety precautions listed in the printed version catalog.

Specifications: FS Series

Item		Specifications		Test Conditions Conforming to JIS C 5102-1994						
Operating Temperature Range		-25°C to +70°C								
Maximum Operating Voltage		5.5 VDC, 11 VDC, 12 VDC								
Nominal Capacitance Range		Refer to standard ratings		Refer to characteristics measuring method.						
Capacitance Allowance		+80%, -20%								
Equivalent Series Resistance		Refer to standard ratings		Refer to characteristics measuring method.						
Current (30-minutes value)		Refer to standard ratings		Refer to characteristics measuring method.						
Surge Voltage	Capacitance	More than 90% of initial requirement		Conforms to 7.14 Surge voltage: 6.3 V (5.5 V products) 12.6 V (11 V products) 13.6 V (12 V products) Temperature: 70 ± 2°C Chargs: 30 seconds Discharge: 9 min. 30 sec. Number of cycles 1000 cycles. Series resistance: 0.022 F 560 Ω 0.047 F 300 Ω 0.1 F 150 Ω 0.22 F 56 Ω 0.47 F 30 Ω 1 F 15 Ω 5 F 10 Ω Discharge resistance: 0 Ω						
	Equivalent series resistance	Not to exceed 120% of initial requirement								
	Current (30-minute value)	Not to exceed 120% of initial requirement								
	Appearance	No obvious abnormality								
Temperature Variation of Characteristics	Phase 2	Capacitance	50% or higher of initial value	Conforms to 7.12 Phase 1: +25 ± 2°C Phase 2: -25 ± 2°C Phase 3: -40 ± 2°C Phase 4: +25 ± 2°C Phase 5: +70 ± 2°C Phase 6: +25 ± 2°C						
		Equivalent series resistance	3 or less times initial value							
	Phase 5	Capacitance	150% or below of initial value							
		Equivalent series resistance	Satisfy initial standard value							
		Current (30-minute value)	1.5 CV (mA) or below							
	Phase 6	Capacitance	Within ± 20% of initial value							
		Equivalent series resistance	Satisfy initial standard value							
		Current (30-minute value)	Satisfy initial standard value							
Lead Strength (Tensile)		No loosening nor permanent damage of the leads		Conforms to 8.1.2 (1) <table border="1"> <tr> <td>5.5 VDC</td> <td>0.022 F to 0.22 F: 1 kg 10 sec</td> </tr> <tr> <td>11 VDC</td> <td>0.47 F to 1.0 F: 2.5 kg 10 sec</td> </tr> <tr> <td>12 VDC</td> <td>2.5 kg 10 sec</td> </tr> </table>	5.5 VDC	0.022 F to 0.22 F: 1 kg 10 sec	11 VDC	0.47 F to 1.0 F: 2.5 kg 10 sec	12 VDC	2.5 kg 10 sec
5.5 VDC	0.022 F to 0.22 F: 1 kg 10 sec									
11 VDC	0.47 F to 1.0 F: 2.5 kg 10 sec									
12 VDC	2.5 kg 10 sec									
Vibration Resistance		Capacitance	Satisfy initial standard value	Conforms to 8.2.3 Frequency: 10 to 55 Hz Test duration: 6 hours						
		Equivalent series resistance								
		Current (30-minute value)								
		Appearance			No obvious abnormality					
Solderability		3/4 or more of the pin surface should be covered with new solder		Conforms to 8.4 Solder temperature: 245 ± 5°C Dipping duration: 5 ± 0.5 sec. Should be dipped up to 1.6 mm from the lower end of the capacitor.						
Soldering Heat Resistance		Capacitance	Satisfy initial standard value	Conforms to 8.5 Solder temperature: 260 ± 10°C Dipping duration: 10 ± 1 sec. Dipped up to 1.6 mm from the lower end of the capacitor.						
		Equivalent series resistance								
		Current (30-minute value)								
		Appearance			No obvious abnormality					
Temperature Cycle		Capacitance	Satisfy initial standard value	Conforms to 9.3 Temperature condition: -25°C → normal temperature → +70°C → normal temperature Number of cycles: 5 cycles						
		Equivalent series resistance								
		Current (30-minute value)								
		Appearance			No obvious abnormality					
Humidity Resistance		Capacitance	90% or higher of initial standard value (5.5 V products) Within 20% of initial value (11 V, 12 V products)	Conforms to 9.5 Temperature: 40 ± 2°C Relative humidity: 90 to 95% RH Test duration: 240 ± 8 hours						
		Equivalent series resistance	1.2 or less times initial standard value							
		Current (30-minute value)	1.2 or less times initial standard value							
		Appearance	No obvious abnormality							
High Temperature Load		Capacitance	85% or higher of initial standard value (5.5 V products) Within ±30% of initial value (11 V, 12 V products)	Conforms to 9.10 Temperature: 70 ± 2°C Voltage applied: Maximum operating voltage Series protection resistance: 0 Ω Test duration: 1000 ⁺⁸ hours						
		Equivalent series resistance	Twice or less times initial standard value							
		Current (30-minute value)	Twice or less times initial standard value							
		Appearance	No obvious abnormality							



- All specifications in this catalog and production status of products are subject to change without notice. Prior to the purchase, please contact NEC TOKIN for updated product data.
- Please request for a specification sheet for detailed product data prior to the purchase.
- Before using the product in this catalog, please read "Precautions" and other safety precautions listed in the printed version catalog.