FY Series

FYD TYPE: SMALL DIAMETER, EXCELLENT VOLTAGE HOLDING CHARACTERISTICS
FYH, and FYL TYPE: LOW PROFILE, EXCELLENT VOLTAGE HOLDING CHARACTERISTICS

The FY series includes small-size electric double-layer capacitors with excellent voltage holding characteristics. The FYD type occupies only a small area on a printed circuit board, and the FYH and FYL types feature a low profile in height, so that they can be used in various systems.
These capacitors are ideal as long-time backup devices for minute-current loads in small and lightweight systems.

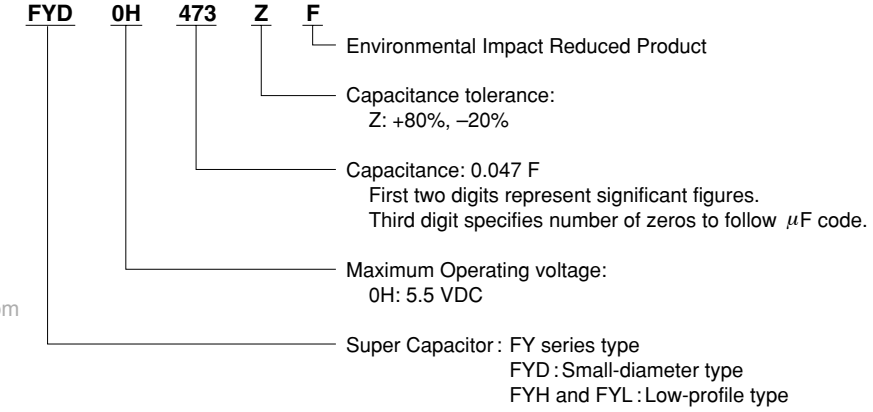
Features

- Product variety makes the FYD, FYH, and FYL types suitable for use in many types of application systems.
- Excellent voltage holding characteristics ideal for backup of 1 μA to several hundred μA.
- Smaller than other Super Capacitors (25% less than FS series in volume)
- Capacitance ranges from low to high (0.01 F to 2.2 F).

Applications

- Backup of CMOS microcomputers, static RAMs, DTSs (digital tuning systems)
- Memory backup of remote controllers and handy cassette player during battery exchange

Part Number System



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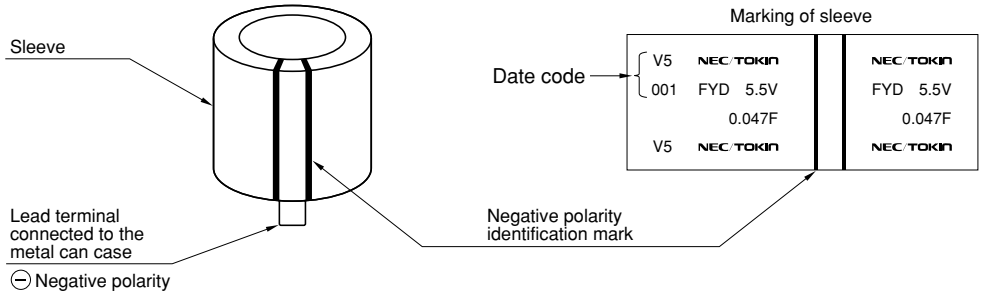
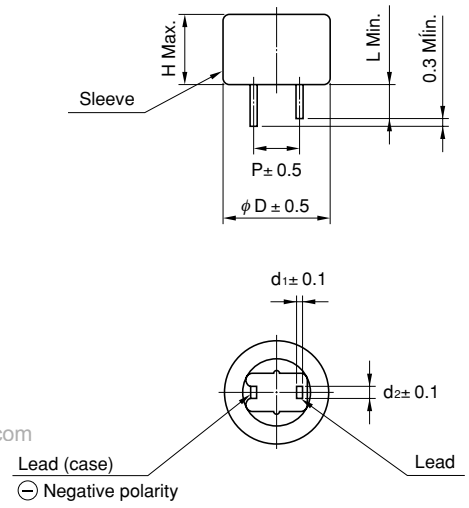
Markings



Dimensions and Standard Ratings

● FYD-Type

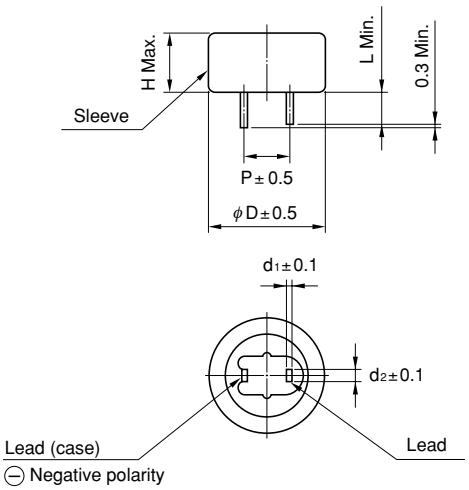


Part No.	Dimensions mm (inch)						Weight
	D	H	P	d_1	d_2	L	g (oz)
FYD0H223ZF	11.5 (0.453)	8.5 (0.335)	5.08 (0.200)	0.4 (0.016)	1.2 (0.047)	2.7 (0.106)	1.6 (0.056)
FYD0H473ZF	11.5 (0.453)	8.5 (0.335)	5.08 (0.200)	0.4 (0.016)	1.2 (0.047)	2.7 (0.106)	1.7 (0.058)
FYD0H104ZF	13.0 (0.512)	8.5 (0.335)	5.08 (0.200)	0.4 (0.016)	1.2 (0.047)	2.2 (0.087)	2.4 (0.085)
FYD0H224ZF	14.5 (0.571)	15.0 (0.591)	5.08 (0.200)	0.4 (0.016)	1.2 (0.047)	2.4 (0.095)	4.3 (0.152)
FYD0H474ZF	16.5 (0.65)	15.0 (0.591)	5.08 (0.200)	0.4 (0.016)	1.2 (0.047)	2.7 (0.106)	6.0 (0.212)
FYD0H105ZF	21.5 (0.85)	16.0 (0.629)	7.62 (0.300)	0.6 (0.024)	1.2 (0.047)	3.0 (0.118)	11.0 (0.338)
FYD0H145ZF	21.5 (0.85)	19.0 (0.748)	7.62 (0.300)	0.6 (0.024)	1.2 (0.047)	3.0 (0.118)	12.0 (0.424)
FYD0H225ZF	28.5 (1.122)	22.0 (0.866)	10.16 (0.400)	0.6 (0.024)	1.4 (0.055)	6.1 (0.240)	22.9 (0.809)

Note: Weight is typical.

Part Number	Max. Operating Voltage (V)	Nominal Capacitance		Max. ESR (at 1 kHz) (Ω)	Max. Current at 30 minutes (mA)	Voltage Holding Characteristic Min. (V)
		Charge System (F)	Discharge System (F)			
FYD0H223ZF	5.5	0.022	0.033	220	0.033	4.2
FYD0H473ZF	5.5	0.047	0.070	220	0.071	4.2
FYD0H104ZF	5.5	0.10	0.14	100	0.15	4.2
FYD0H224ZF	5.5	0.22	0.35	120	0.33	4.2
FYD0H474ZF	5.5	0.47	0.75	65	0.71	4.2
FYD0H105ZF	5.5	1.0	1.6	35	1.5	4.2
FYD0H145ZF	5.5	1.4	2.1	45	2.1	4.2
FYD0H225ZF	5.5	2.2	3.3	35	3.3	4.2

● FYH-Type



Part No.	Dimensions mm (inch)						Weight
	D	H	P	d_1	d_2	L	g (oz)
FYH0H223ZF	11.5 (0.453)	7.0 (0.276)	5.08 (0.200)	0.4 (0.016)	1.2 (0.047)	2.7 (0.106)	1.5 (0.053)
FYH0H473ZF	13.0 (0.512)	7.0 (0.276)	5.08 (0.200)	0.4 (0.016)	1.2 (0.047)	2.2 (0.087)	2.2 (0.078)
FYH0H104ZF	16.5 (0.65)	7.5 (0.295)	5.08 (0.200)	0.4 (0.016)	1.2 (0.047)	2.7 (0.106)	3.4 (0.120)
FYH0H224ZF	16.5 (0.65)	9.5 (0.374)	5.08 (0.200)	0.4 (0.016)	1.2 (0.047)	2.7 (0.106)	3.6 (0.127)
FYH0H474ZF	21.5 (0.85)	10.0 (0.394)	7.62 (0.300)	0.6 (0.024)	1.2 (0.047)	3.0 (0.118)	7.2 (0.255)
FYH0H105ZF	28.5 (1.122)	11.0 (0.433)	10.16 (0.400)	0.6 (0.024)	1.4 (0.055)	6.1 (0.240)	13.9 (0.491)

Note: Weight is typical.

Part Number	Max. Operating Voltage (V)	Nominal Capacitance		Max. ESR (at 1 kHz) (Ω)	Max. Current at 30 minutes (mA)	Voltage Holding Characteristic Min. (V)
		Charge System (F)	Discharge System (F)			
FYH0H223ZF	5.5	0.022	0.033	200	0.033	4.2
FYH0H473ZF	5.5	0.047	0.075	100	0.071	4.2
FYH0H104ZF	5.5	0.10	0.16	50	0.15	4.2
FYH0H224ZF	5.5	0.22	0.30	60	0.33	4.2
FYH0H474ZF	5.5	0.47	0.70	35	0.71	4.2
FYH0H105ZF	5.5	1.0	0.50	20	1.5	4.2

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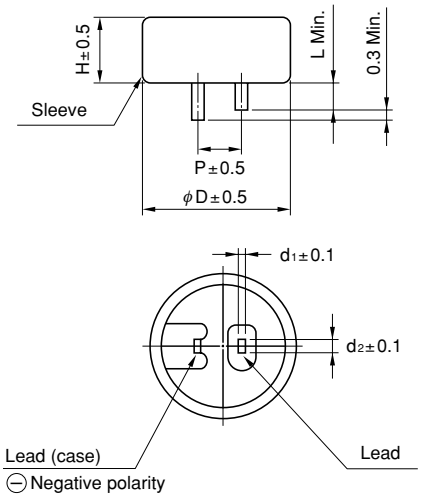
● FYL-Type



Part No.	Dimensions mm (inch)						Weight
	D	H	P	d_1	d_2	L	g (oz)
FYL0H103ZF	11.0 (0.43)	5.0 (0.197)	5.08 (0.200)	0.2 (0.016)	1.2 (0.047)	2.7 (0.106)	0.9 (0.032)
FYL0H223ZF	11.0 (0.43)	5.0 (0.197)	5.08 (0.200)	0.2 (0.016)	1.2 (0.047)	2.7 (0.106)	1.0 (0.035)
FYL0H473ZF	12.0 (0.47)	5.0 (0.197)	5.08 (0.200)	0.2 (0.016)	1.2 (0.047)	2.7 (0.106)	1.2 (0.042)

Note: Weight is typical.

Part Number	Max. Operating Voltage (V)	Nominal Capacitance		Max. ESR (at 1 kHz) (Ω)	Max. Current at 30 minutes (mA)	Voltage Holding Characteristic Min. (V)
		Charge System (F)	Discharge System (F)			
FYL0H103ZF	5.5	0.010	0.013	300	0.015	4.2
FYL0H223ZF	5.5	0.022	0.028	200	0.033	4.2
FYL0H473ZF	5.5	0.047	0.061	200	0.071	4.2

Specifications: FY Series

Items		Specifications		Test Conditions Conforming to JIS C 5102-1994
Operating Temperature Range		–25˚C to +70˚C		
Maximum Operating Voltage		5.5 Vdc		
Nominal Capacitance Range		Refer to standard ratings		
Capacitance Allowance		+80 %, –20 %		Refer to characteristics measuring conditions
Equivalent Series Resistance		Refer to standard ratings		Refer to characteristics measuring conditions
Current (30-minutes Value)		Refer to standard ratings		Refer to characteristics measuring conditions
Surge Voltage		Capacitance	More than 90 % of initial requirement	Conforms to 7.14 Surge voltage: 6.3 V Temperature: 70 ± 2˚C Charging for 30 seconds Discharging for 9 min. 30 sec. Number of cycles 1 000 cycles Charge resistance : 0.01 F 1500 Ω 0.47 F 30 Ω 0.022 F 560 Ω 1.0 F 15 Ω 0.047 F 300 Ω 1.4 F 15 Ω 0.10 F 150 Ω 2.2 F 10 Ω 0.22 F 56 Ω No discharge resistance
		Equivalent Series Resistance	Less than 120% of initial requirement	
		Current at 30 minutes	Less than 120% of initial requirement	
		Appearance	No obvious abnormality	
Temperature Variation of Characteristics	Phase 2	Capacitance	More than 50 % 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	Less than 400% of initial value	
	Phase 5	Capacitance	Less than 200% of initial value	
		Equivalent Series Resistance	Initial requirement	
		Current at 30 minutes	Less than 1.5 CV (mA)	
	Phase 6	Capacitance	Within ± 20% of initial value	
		Equivalent Series Resistance	Initial requirement	
		Current at 30 minutes	Initial requirement	
Lead Strength (Tensile)		No loosening nor permanent damage of the leads		Conforms to 8.1.2 (1) FYD0H105Z FYD0H145Z FYD0H225Z : 2.5 kg-f 10 ± 1 sec. FYH0H474Z FYH0H105Z Others: 1.0 kg-f 10 ± 1 sec.
Vibration Resistance		Capacitance	Meet initial requirements	Conforms to 8.2.3 Frequency: 10 to 55 Hz Time of test: 6 hours
		Equivalent Series Resistance		
		Current at 30 minutes		
		Appearance	No obvious abnormality	
Solderability		3/4 or more of the pin of surface should be covered with the solder		Conforms to 8.4 Temperature of solder: 245 ± 5˚C Time of immersion: 5 ± 0.5 second To immerse capacitors up to 1.6 mm from the bottom
Soldering Heat Resistance		Capacitance	Meet initial requirements	Conforms to 8.5 Temperature of solder: 260 ± 10˚C Time of immersion: 10 ± 1 seconds To immerse capacitors up to 1.6 mm from the bottom
		Equivalent Series Resistance		
		Current at 30 minutes		
		Appearance	No obvious abnormality	
Temperature Cycle		Capacitance	Shall meet initial requirements	Conforms to 9.3 Temperature condition: –25˚C → normal temperature → +70˚C → normal temperature Number of cycles: 5 cycles
		Equivalent Series Resistance		
		Current at 30 minutes		
		Visual appearance	No obvious abnormality	
Humidity Resistance		Capacitance	Within ± 20% of initial value	Conforms to 9.5 Temperature: 40 ± 2˚C Humidity: 90 to 95% RH Time of test: 240 ± 8 hours
		Equivalent Series Resistance	Less than 120% of initial requirement	
		Current at 30 minutes	Less than 120% of initial requirement	
		Appearance	No obvious abnormality	
High Temperature Load		Capacitance	Within ± 30% of initial value	Conforms to 9.10 Temperature: 70 ± 2˚C Series resistance: 0 Ω Applied voltage: 5.5 VDC Time of test: 1000 $^{+48}_{-0}$ hours
		Equivalent Series Resistance	Less than 200% of initial requirement	
		Current at 30 minutes	Less than 200% of initial requirement	
		Appearance	No obvious abnormality	
Voltage Holding Characteristics (Self Discharge)		Voltage between terminal leads higher than 4.2 V.		Charging condition: Applied voltage: 5.0 VDC Series resistance: 0 Ω Curging time: 24 hours
				Storage: Load: Nothing Temperature: Lower than 25˚C Humidity: Lower than 70% RH Time: 24 hours

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