

FG Series

The FG series includes small-size electric double-layer capacitors with excellent voltage holding characteristics. The FG series are ideal as long-time backup devices for minute-current loads in small and lightweight systems.

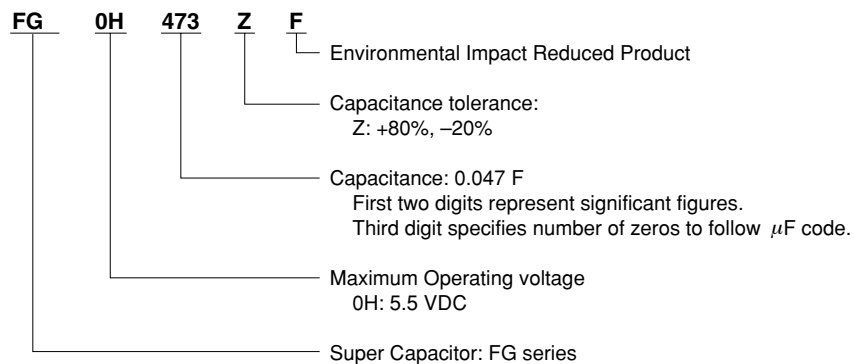
Features

- The volume of the products is approx. 1/2 that of the FYD type products. (0.22F~2.2F)
- Added 4.7F/5.5V to series.
- Miniaturized 0.047F/5.5V and 0.10F/5.5V

Applications

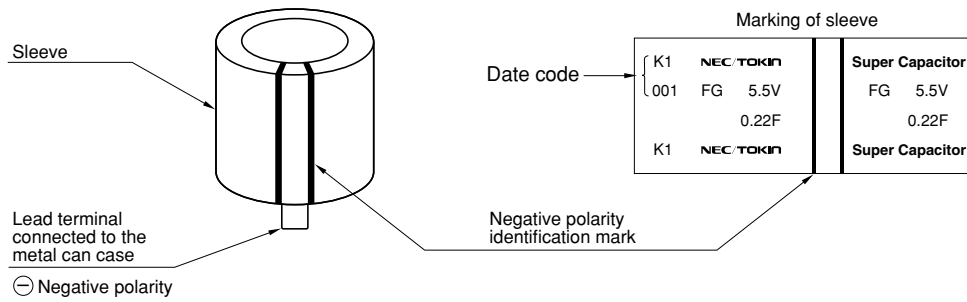
- Backup of CMOS microprocessors, static RAMs, DTSs (digital tuning systems)
- Memory backup of remote controllers and handy cassette player during battery exchange

Part Number System

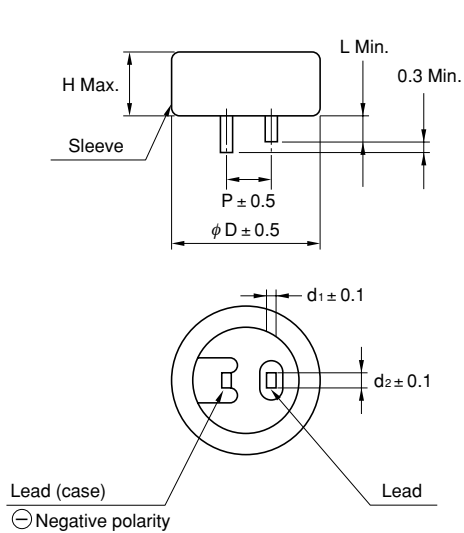


- All specifications in this catalog and production status of products are subject to change without notice. Prior to the purchase, please contact NEC TOKIN for updated product data.
- Please request for a specification sheet for detailed product data prior to the purchase.
- Before using the product 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	
FG0H103ZF	11.0 (0.43)	5.5 (0.215)	5.08 (0.200)	0.2 (0.016)	1.2 (0.047)	2.7 (0.106)	0.9 (0.032)
FG0H223ZF	11.0 (0.43)	5.5 (0.215)	5.08 (0.200)	0.2 (0.016)	1.2 (0.047)	2.7 (0.106)	1.0 (0.035)
FG0H473ZF	11.0 (0.43)	5.5 (0.215)	5.08 (0.200)	0.2 (0.016)	1.2 (0.047)	2.7 (0.106)	1.0 (0.035)
FG0H104ZF	11.0 (0.43)	6.5 (0.256)	5.08 (0.200)	0.2 (0.016)	1.2 (0.047)	2.7 (0.106)	1.3 (0.046)
FG0H224ZF	13.0 (0.512)	9.0 (0.355)	5.08 (0.200)	0.4 (0.016)	1.2 (0.047)	2.2 (0.087)	2.5 (0.088)
FG0H474ZF	14.5 (0.571)	18.0 (0.709)	5.08 (0.200)	0.4 (0.016)	1.2 (0.047)	2.4 (0.095)	5.1 (0.180)
FG0H105ZF	16.5 (0.65)	19.0 (0.749)	5.08 (0.200)	0.4 (0.016)	1.2 (0.047)	2.7 (0.106)	7.0 (0.247)
FG0H225ZF	21.5 (0.85)	19.0 (0.749)	7.62 (0.300)	0.6 (0.024)	1.2 (0.047)	3.0 (0.118)	12.1 (0.427)
FG0H475ZF	28.5 (1.122)	22.0 (0.867)	10.16 (0.400)	0.6 (0.024)	1.4 (0.055)	6.1 (0.240)	27.3 (0.964)
FG0V155ZF	16.5 (0.65)	14.0 (0.551)	5.08 (0.200)	0.4 (0.016)	1.2 (0.047)	3.1 (0.122)	5.2 (0.185)

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 (mA)	Voltage Holding Characteristic Min.(V)
		Charge System (F)	Discharge System (F)			
FG0H103ZF	5.5	0.01	0.013	300	0.015	4.2
FG0H223ZF	5.5	0.022	0.028	200	0.033	4.2
FG0H473ZF	5.5	0.047	0.060	200	0.071	4.2
FG0H104ZF	5.5	0.10	0.13	100	0.15	4.2
FG0H224ZF	5.5	0.22	0.28	100	0.33	4.2
FG0H474ZF	5.5	0.47	0.60	120	0.71	4.2
FG0H105ZF	5.5	1.0	1.3	65	1.5	4.2
FG0H225ZF	5.5	2.2	2.8	35	3.3	4.2
FG0H475ZF	5.5	4.7	6.0	35	7.1	4.2
FG0V155ZF	3.5	1.5	2.2	65	1.5	—



- 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: FG Series

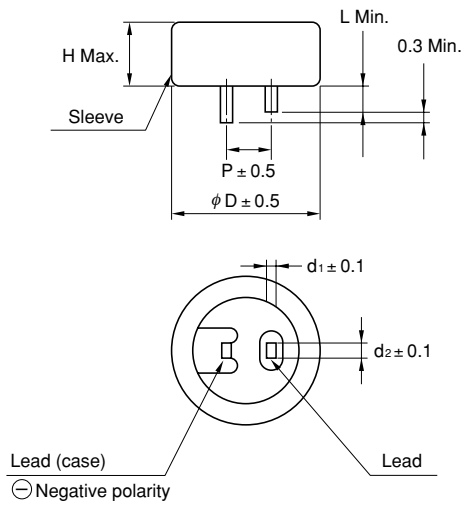
Items		Specifications		Test Conditions Conforming to JIS C 5102 ¹⁹⁹⁴	
Operating Temperature Range		-25°C to +70°C			
Maximum Operating Voltage		5.5 Vdc, 3.5 Vdc			
Nominal Capacitance Range		Refer to standard ratings		Refer to characteristics measuring method.	
Capacitance Allowance		+80 %, -20 %		Refer to characteristics measuring method.	
Equivalent Series Resistance		Refer to standard ratings		Refer to characteristics measuring method.	
Current (30-minute 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: 6.3V(5.5V products), 4.0V(3.5V products) Temperature: 70±2°C Charge: 30 sec. Discharge: 9 min 30 sec. Number of cycles: 1000 cycles Series resistance: 0.010F: 1500 Ω 0.47F: 30 Ω 0.022F: 560 Ω 1.0F: 15 Ω 0.047F: 300 Ω 1.5F: 15 Ω 0.10F: 150 Ω 2.2F: 10 Ω 0.22F: 56 Ω 4.7F: 10 Ω Discharge resistance: 0 Ω	
		Equivalent series resistance	Not to exceed 120% of initial requirement		
		Current at 30 min.	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 4: +25 ±2°C Phase 5: +70 ±2°C Phase 6: +25 ±2°C	
		Equivalent series resistance	4 or less times initial value		
	Phase 5	Capacitance	200% or below of initial value		
		Equivalent series resistance	Satisfy initial standard value		
		Current at 30 min.	1.5 CV (mA) or below		
	Phase 6	Capacitance	Within ±20% of initial value		
		Equivalent series resistance	Satisfy initial standard value		
		Current at 30 min.	Satisfy initial standard value		
Lead Strength (Tensile)		No loosening nor permanent damage of the leads		Conforms to 8.1.2 (1)	
Vibration Resistance		Capacitance	Satisfy initial standard value	Conforms to 8.2.3 (1) Frequency: 10 to 55 Hz Test duration: 6 hours	
		Equivalent series resistance			
		Current at 30 min.			
		Appearance			
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 1.6mm 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. Should be dipped up to 1.6mm from the lower end of the capacitor	
		Equivalent series resistance			
		Current at 30 min.			
		Appearance			
Temperature Cycle		Capacitance	Satisfy initial standard value	Conforms to 9.3 Temperature: -25°C → normal temperature → +70°C → normal temperature Number of cycles: 5 cycles	
		Equivalent series resistance			
		Current at 30 min.			
		Appearance			
Humidity Resistance		Capacitance	Within ±20% of initial value	Conforms to 9.5 Temperature: 40±2°C Relative humidity: 90 to 95% RH Test duration: 240 ±8hours	
		Equivalent series resistance	1.2 or less times initial standard value		
		Current at 30 min.	1.2 or less times initial standard value		
		Appearance	No obvious abnormality		
High Temperature Load		Capacitance	Within ±30% of initial value	Conforms to 9.10 Temperature: 70±2°C Voltage applied: MAX. Operating Voltage Series protection resistance: 0Ω Test duration: 1000 ^{±6h} hours	
		Equivalent series resistance	Twice or less times initial standard value		
		Current at 30 min.	Twice or less times initial standard value		
		Appearance	No obvious abnormality		
Voltage Holding Characteristics (Self Discharge)		Voltage between terminal leads higher than 4.2V (3.5V Type: no standard)		Charging Condition	Voltage applied: 5.0VDC (with case side terminal negative) Series resistance: 0Ω Charging time: 24 hours
				Storage	Time: 24 hours Temperature: Lower than 25°C Humidity: Lower than 70%RH



- 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.

● FG H Type

Dimensions



Part No.	Dimensions mm						Weight
	D	H	P	d ₁	d ₂	L	g
FGH0H104ZF	11.0	5.5	5.08	0.2	1.2	2.7	1.0
FGH0H224ZF	11.0	7.0	5.08	0.2	1.2	2.7	1.3
FGH0H474ZF	16.5	8.0	5.08	0.4	1.2	2.7	4.1
FGH0H105ZF	21.5	9.5	7.62	0.6	1.2	3.0	7.2

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 (mA)	Voltage Holding Characteristic Min.(V)
		Charge System (F)	Discharge System (F)			
FGH0H104ZF	5.5	—	0.10	100	0.15	4.2
FGH0H224ZF	5.5	—	0.22	100	0.33	4.2
FGH0H474ZF	5.5	—	0.47	65	0.71	4.2
FGH0H105ZF	5.5	—	1.0	35	1.5	4.2



- 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: FG Series FGH Type

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		Refer to characteristics measuring method.	
Capacitance Allowance		+80 %, -20 %		Refer to characteristics measuring method.	
Equivalent Series Resistance		Refer to standard ratings		Refer to characteristics measuring method.	
Current (30-minute 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: 6.3V Temperature: 70±2°C Charge: 30 sec. Discharge: 9 min 30 sec. Number of cycles: 1000 cycles Series resistance: 0.10F: 150 Ω 0.22F: 56 Ω 0.47F: 30 Ω 1.0F: 15 Ω Discharge resistance: 0 Ω	
		Equivalent series resistance	Not to exceed 120% of initial requirement		
Current at 30 min.	Not to exceed 120% of initial requirement				
Appearance	No obvious abnormality				
Capacitance	50% or higher of initial value				
Temperature Variation of Characteristics	Phase 2	Equivalent series resistance	4 or less times initial value	Conforms to 7.12 Phase 1: +25 ±2°C Phase 2: -25 ±2°C Phase 4: +25 ±2°C Phase 5: +70 ±2°C Phase 6: +25 ±2°C	
		Capacitance	200% or below of initial value		
	Phase 5	Equivalent series resistance	Satisfy initial standard value		
		Current at 30 min.	1.5 CV (mA) or below		
	Phase 6	Capacitance	Within ±20% of initial value		
		Equivalent series resistance	Satisfy initial standard value		
		Current at 30 min.	Satisfy initial standard value		
	Lead Strength (Tensile)		No loosening nor permanent damage of the leads		Conforms to 8.1.2 (1)
Vibration Resistance		Capacitance	Meet initial standard value	Conforms to 8.2.3 Frequency: 10 to 55 Hz Test duration: 6 hours	
		Equivalent series resistance			
		Current at 30 min.			
		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 1.6mm from the lower end of the capacitor	
Solder Heat Resistance		Capacitance	Should satisfy initial standard value	Conforms to 8.5 Solder temperature: 260±10°C Dipping duration: 10±1 sec. Should be dipped up to 1.6mm from the lower end of the capacitor	
		Equivalent series resistance			
		Current at 30 min.			
		Appearance			No obvious abnormality
Temperature Cycle		Capacitance	Satisfy initial standard value	Conforms to 9.3 Temperature: -25°C → normal temperature → +70°C → normal temperature Number of cycles: 5 cycles	
		Equivalent series resistance			
		Current at 30 min.			
		Appearance			No obvious abnormality
Humidity Resistance		Capacitance	Within ±20% of initial value	Conforms to 9.5 Temperature: 40±2°C Relative humidity: 90 to 95% RH Test duration: 240 ±8hours	
		Equivalent series resistance			1.2 or less times initial standard value
		Current at 30 min.			1.2 or less times initial standard value
		Appearance			No obvious abnormality
High Temperature Load		Capacitance	Within ±30% of initial value	Conforms to 9.10 Temperature: 70±2°C Voltage applied: 5.5Vdc Series protection resistance: 0Ω Test duration: 1000 ^{min} hours	
		Equivalent series resistance			Twice or less times initial standard value
		Current at 30 min.			Twice or less times initial standard value
		Appearance			No obvious abnormality
Voltage Holding Characteristics (Self Discharge)		Voltage between terminal leads higher than 4.2V		Charging Condition	Voltage applied: 5.0VDC (with case side terminal negative) Series resistance: 0Ω Charging time: 24 hours
				Storage	Time: 24 hours Temperature: Lower than 25°C Humidity: Lower than 70%RH



- 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.