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.

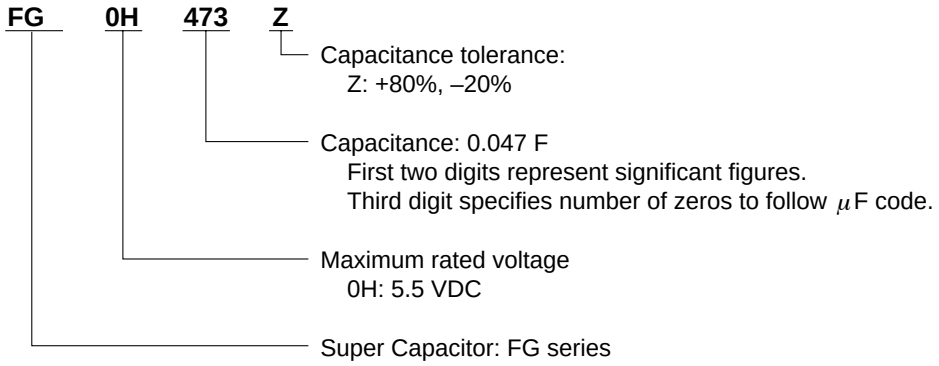
Features

- 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

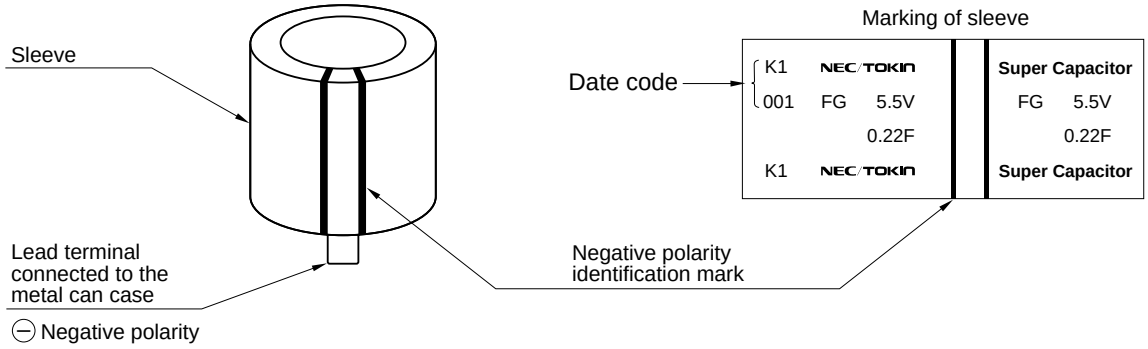
- Backup of CMOS microprocessors, static RAMs, DTSs (digital tuning systems)
- Memory backup of remote controllers and handy cassette player during battery exchange

Part Number System

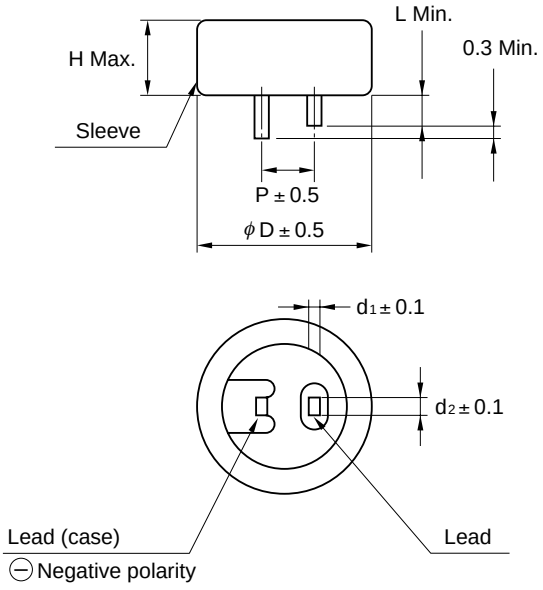


Markings

Markings are made with black ink on the green sleeve.



Dimensions and Standard Ratings



Part No.	Dimensions mm (inch)						Weight
	D	H	P	d_1	d_2	L	g (oz)
FG0H103Z	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)
FG0H223Z	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)
FG0H473Z	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)
FG0H104Z	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)
FG0H224Z	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)
FG0H474Z	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)
FG0H105Z	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)
FG0H225Z	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)
FG0H475Z	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)

Note: Weight is typical.

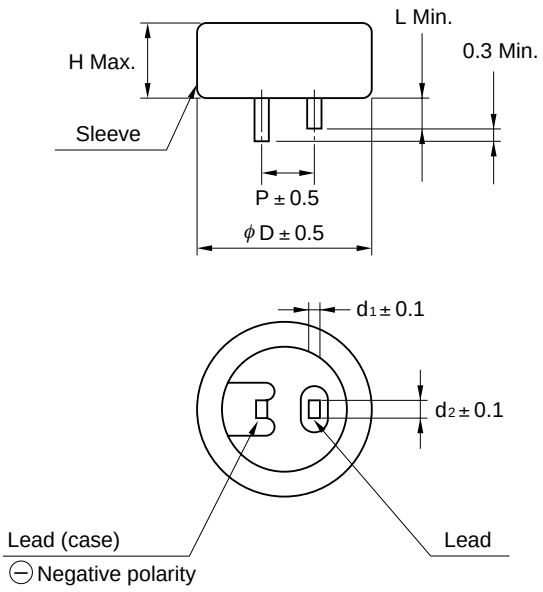
Part Number	Max. Rated Voltage (V)	Nominal Capacitance Charge System (F)	Nominal Capacitance Discharge System (F)	Max. ESR (at 1 kHz) (Ω)	Max. Current at 30 minutes (mA)	Voltage Holding Characteristic Min.(V)
FG0H103Z	5.5	0.01	0.013	300	0.015	4.2
FG0H223Z	5.5	0.022	0.028	200	0.033	4.2
FG0H473Z	5.5	0.047	0.060	200	0.071	4.2
FG0H104Z	5.5	0.10	0.13	100	0.15	4.2
FG0H224Z	5.5	0.22	0.28	100	0.33	4.2
FG0H474Z	5.5	0.47	0.60	120	0.71	4.2
FG0H105Z	5.5	1.0	1.3	65	1.5	4.2
FG0H225Z	5.5	2.2	2.8	35	3.3	4.2
FG0H475Z	5.5	4.7	6.0	35	7.1	4.2

Specifications

Items		Standard		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		0.010 to 4.7 F		See characteristics measuring method	
Capacitance Allowance		+80 %, –20 %		See characteristics measuring method	
Equivalent Series Resistance		See standard list		See characteristics measuring method	
Current (30-minute value)		See standard list		See 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: 0.010F: 1500 Ω 0.47F: 30 Ω 0.022F: 560 Ω 1.0F: 15 Ω 0.047F: 300 Ω 2.2F: 10 Ω 0.10F: 150 Ω 4.7F: 10 Ω 0.22F: 56 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 3: –40 ±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	Meet 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	No obvious abnormality		
Solderability		3 / 4 or more of the pin surface should be covered with new solder		Conforms to 8.4 Solder temperature: 230±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	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^{+48}_{0} 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

● **FGH Type**

Dimensions and Standard Ratings



Part No.	Dimensions mm						Weight
	D	H	P	d_1	d_2	L	g
FGH0H104Z	11.0	5.5	5.08	0.2	1.2	2.7	1.0
FGH0H224Z	11.0	7.0	5.08	0.2	1.2	2.7	1.3
FGH0H474Z	16.5	8.0	5.08	0.4	1.2	2.7	4.1
FGH0H105Z	21.5	9.5	7.62	0.6	1.2	3.0	7.2

Note: Weight is typical.

Part Number	Max. Rated 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)			
FGH0H104Z	5.5	–	0.10	100	0.15	4.2
FGH0H224Z	5.5	–	0.22	100	0.33	4.2
FGH0H474Z	5.5	–	0.47	65	0.71	4.2
FGH0H105Z	5.5	–	1.0	35	1.5	4.2

Specifications FGH Type

Items		Standard		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		0.10 to 1.0 F		See characteristics measuring method	
Capacitance Allowance		+80 %, –20 %		See characteristics measuring method	
Equivalent Series Resistance		See standard list		See characteristics measuring method	
Current (30-minute value)		See standard list		See 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 inital requirement		
		Current at 30 min.	Not to exceed 120% of inital 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	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	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: 230±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^{+48}_{0} 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