FC Series

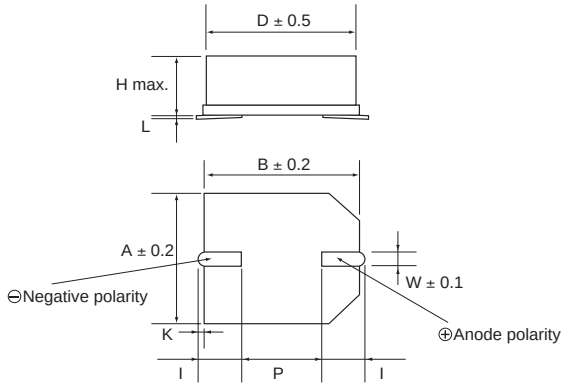
Features

- Enables surface mounting.
- High rated voltage of 5.5V.
- High reliability solution leakage.

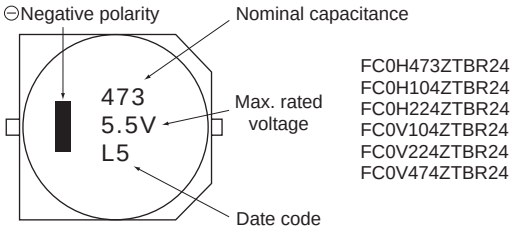
Applications

- Subsidiary power supply.
  Buck up power supply line.
  Memory backup during battery exchange.

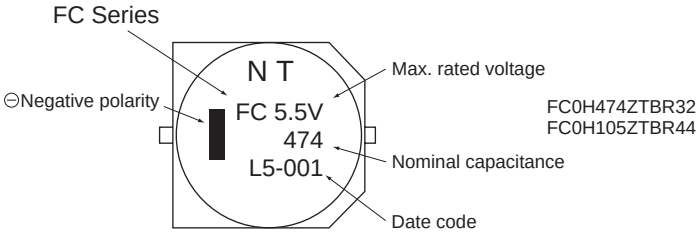
Dimensions



Markings



FC0H473ZTBR24
FC0H104ZTBR24
FC0H224ZTBR24
FC0V104ZTBR24
FC0V224ZTBR24
FC0V474ZTBR24



FC0H474ZTBR32
FC0H105ZTBR44

Standard Rating

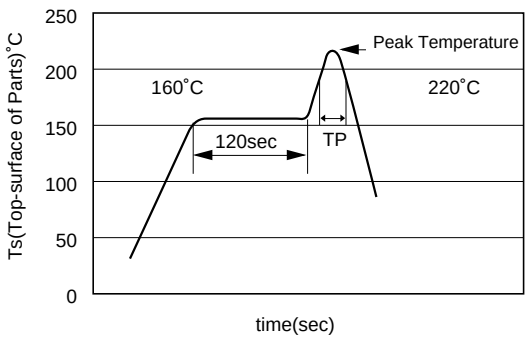
Part Number	Max. Rated Voltage (Vdc)	Nominal Capacitance Discharge system (F)	Max. ESR (at 1kHz) (Ω)	Max. current at 30 minutes (mA)	Voltage Holding Characteristic Min. (V)	Dimension (Unit:mm)								
						D	H	A	B	I	W	P	K	L
FC0H473ZTBR24	5.5	0.047	50	0.071	4.2	10.5	5.5	10.8	10.8	3.6±0.5	1.2	5.0	0.7±0.2	$0^{+0.3}_{-0.1}$
FC0H104ZTBR24	5.5	0.10	25	0.15	4.2	10.5	5.5	10.8	10.8	3.6±0.5	1.2	5.0	0.7±0.2	$0^{+0.3}_{-0.1}$
FC0H224ZTBR24	5.5	0.22	25	0.33	4.2	10.5	8.5	10.8	10.8	3.6±0.5	1.2	5.0	0.7±0.2	$0^{+0.3}_{-0.1}$
FC0H474ZTBR32	5.5	0.47	13	0.71	4.2	16.0	9.5	16.3	16.3	6.8±1.0	1.2	5.0	1.2±0.35	$0^{+0.5}_{-0.1}$
FC0H105ZTBR44	5.5	1.00	7	1.50	4.2	21.0	10.5	21.6	21.6	7.0±1.0	1.4	10.0	1.2±0.35	$0^{+0.5}_{-0.1}$
FC0V104ZTBR24	3.5	0.10	50	0.090	–	10.5	5.5	10.8	10.8	3.6±0.5	1.2	5.0	0.7±0.2	$0^{+0.3}_{-0.1}$
FC0V224ZTBR24	3.5	0.22	25	0.20	–	10.5	5.5	10.8	10.8	3.6±0.5	1.2	5.0	0.7±0.2	$0^{+0.3}_{-0.1}$
FC0V474ZTBR24	3.5	0.47	25	0.42	–	10.5	8.5	10.8	10.8	3.6±0.5	1.2	5.0	0.7±0.2	$0^{+0.3}_{-0.1}$

Precautions for use

- This capacitor is exclusive use of reflow soldering.
  It's designed for thermal conduction system such as infrared ray (IR) or heat blow.
  For applying other methods, Please consult with us first.
- Graph attheleft,"Reflow Condition" indicares the surface temperature at the top of capacitor.

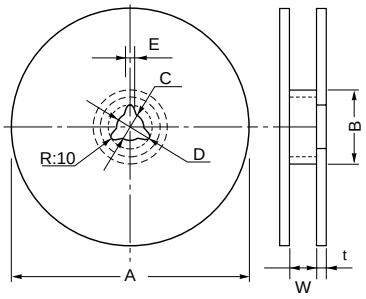
- Reflow Condition

Reflow Profile



Tape and Reel Dimensions

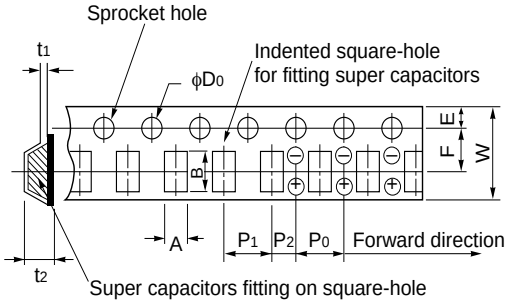
[Reel Dimensions]



(mm)

Mark	TBR24		TBR32	TBR44
A	380±2		330±2	380±2
B	Product height 5.5mm	80±1	100±1	100±1
	Product height 8.5mm	100±1		
C	13±0.5		13±0.5	13±0.5
D	21±0.8		21±0.8	21±0.8
E	2±0.5		2±0.5	2±0.5
W	25.5±0.5		32.5±0.5	44.5±0.5
t	Product height 5.5mm	3.0	2.8	2.8
	Product height 8.5mm	2.8		

Dimensions of indented [square-hole plastic tape]



(mm)

Mark	TBR24	TBR32	TBR44
W	24.0	32.0	44.0
A	11.4	18.0	23.0
B	13.0	20.0	25.0
P_0	4.0	4.0	4.0
P_1	16.0	24.0	32.0
P_2	2.0	2.0	2.0
F	11.5	14.2	20.2
ϕD_0	1.55	1.55	1.55
t_1	0.4	0.5	0.5
E	1.75	1.75	1.75
t_2	5.8	10.0	12.0

Number of pachaged Super capacitors

Part Number	Packaging
FC0H473ZTBR24	1000pcs./reel
FC0H104ZTBR24	1000pcs./reel
FC0H224ZTBR24	500pcs./reel
FC0H474ZTBR32	200pcs./reel
FC0H105ZTBR44	150pcs./reel
FC0V104ZTBR24	1000pcs./reel
FC0V224ZTBR24	1000pcs./reel
FC0V474ZTBR24	500pcs./reel

Specifications 5.5V Type

Item		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		0.047 to 1.0F		See characteristics measuring method.
Capacitance Allowance		+80%, –20%		See characteristics measuring method.
Equivalent Series Resistance		See standard list		See characteristics measuring method.
Current (30-minutes value)		See standard list		See characteristics measuring method.
*Surge Voltage20		Capacitance	More than 90% of initial requirement	Conforms to 7.14 Surge Voltage: 6.3 V(5.5V products) Temperature: 70 ± 2˚C Charge: 30 sec. Discharge: 9 min. 30 sec. Number of cycles 1000 cycles. Charge resistance: 0.047F 300 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	4 or less times initial value	
	Phase 5	Capacitance	200% or below of initial value	
		Equivalent series resistance	Satisty initial standard value	
		Current (30-minute value)	1.5 CV (mA) or below	
	Phase 6	Capacitance	Within ±20% of initial value	
		Equivalent series resistance	Satisty initial standard value	
		Current (30-minute value)	Satisty initial standard value	
*Vibration Resistance		Capacitance	Satisty 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	
*Soldering Heat Resistance		Capacitance	Satisty 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 able abnormality	
*Temperature Cycle		Capacitance	Satisty 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	Within 20% of initial value	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 obuious abnormality	
*High Temperature Load		Capacitance	Within 30% of initial value	Conforms to 9.10 Temperature: 70 ± 2°C Voltage applied: 5.5 Vdc Series protection resistance: 0 Ω Test duration: 1000^{+48}_{0} 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	
*Voltage Holding Characteristics (Self Dischage)		Voltage between terminal leads higher than 4.2 V		Charging condition: Voltage applied: 5.0 VDC Series resistance: 0 Ω Charging time: 24hours
				Storage: Time: 24hours Temperature:Lower than 25°C

* The characteristics above must be satisfied for asterisked items after the end of reflow soldering (according to the reflow condition shown on page).

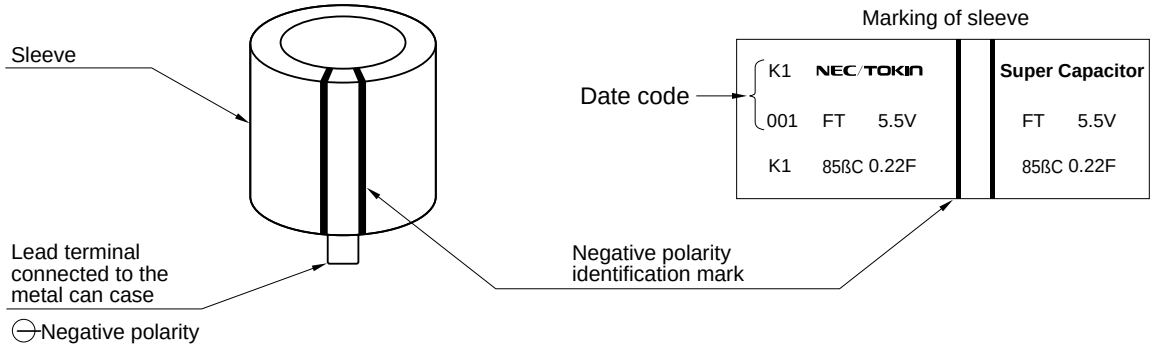
Specifications 3.5V Type

Item		Standard		Test Conditions conforming to JIS C 5012-1994
Operating Temperature Range		–25°C to +70°C		
Maximum Operating Voltage		3.5 VDC		
Nominal Capacitance Range		0.010 to 0.47F		See characteristics measuring method.
Capacitance Allowance		+80%, –20%		See characteristics measuring method.
Equivalent Series Resistance		See standard list		See characteristics measuring method.
Current (30-minutes value)		See standard list		See characteristics measuring method.
*Surge Voltage		Capacitance	More than 90% of initial requirement	Conforms to 7.14 Surge Voltage: 4.0 V(3.5V products) Temperature: 70 ± 2°C Charge: 30 sec. Discharge: 9 min. 30 sec. Number of cycles 1000 cycles. Charge 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 (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	4 or less times initial value	
	Phase 5	Capacitance	200% or below of initial value	
		Equivalent series resistance	Satisty initial standard value	
		Current (30-minute value)	1.5 CV (mA) or below	
	Phase 6	Capacitance	Within ±20% of initial value	
		Equivalent series resistance	Satisty initial standard value	
		Current (30-minute value)	Satisty initial standard value	
*Vibration Resistance		Capacitance	Satisty 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	
*Soldering Heat Resistance		Capacitance	Satisty 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 able abnormality	
*Temperature Cycle		Capacitance	Satisty 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	Within 20% of initial value	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 obuious abnormality	
*High Temperature Load		Capacitance	Within 30% of initial value	Conforms to 9.10 Temperature: 70 ± 2°C Voltage applied: 3.5 Vdc Series protection resistance: 0 Ω Test duration: $1000\ ^{+48}_{0}$ 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	

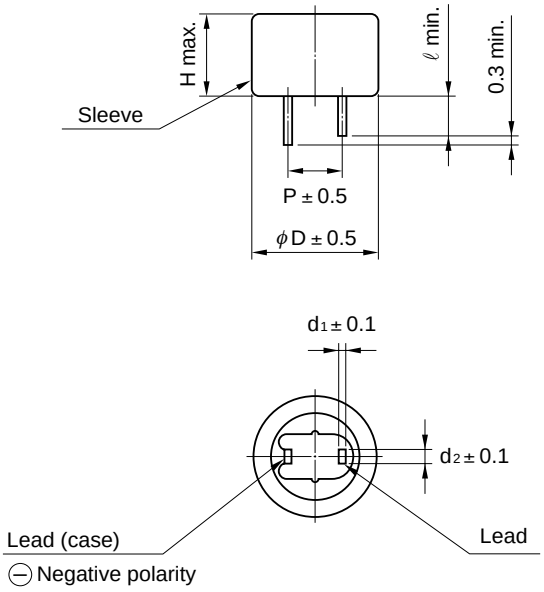
* The characteristics above must be satisfied for asterisked items after the end of reflow soldering (according to the reflow condition shown on page).

Markings

Markings are made with black ink on the green sleeve.



Dimensions and Standard Ratings



Part No.	Dimensions mm (inch)						Weight (g) (oz)
	D	H	P	d_1	d_2	ℓ	
FT0H104Z	11.5 (0.453)	8.5 (0.335)	5.08 (0.2)	0.4 (0.016)	1.2 (0.047)	2.7 (0.106)	1.6 (0.057)
FT0H224Z	14.5 (0.57)	12.0 (0.47)	5.08 (0.2)	0.4 (0.016)	1.2 (0.047)	2.2 (0.087)	4.1 (0.145)
FT0H474Z	16.5 (0.65)	13.0 (0.512)	5.08 (0.2)	0.4 (0.016)	1.2 (0.047)	2.7 (0.106)	5.3 (0.187)
FT0H105Z	21.5 (0.85)	13.0 (0.512)	7.62 (0.3)	0.6 (0.024)	1.2 (0.047)	3.0 (0.118)	10.0 (0.353)
FT0H225Z	28.5 (1.12)	14.0 (0.55)	10.16 (0.4)	0.6 (0.024)	1.4 (0.055)	6.1 (0.240)	18.0 (0.635)
FT0H335Z	36.5 (1.44)	15.0 (0.588)	15.00 (0.59)	0.6 (0.024)	1.7 (0.067)	6.1 (0.240)	38.0 (1.34)
FT0H565Z	44.5 (1.75)	17.0 (0.67)	20.00 (0.79)	1.0 (0.039)	1.4 (0.055)	6.1 (0.240)	72.0 (2.54)

Note: Weight is typical.

Part Number	Max. Rated Voltage (V)	Nomial Capacitance Charge System (F)	Discharge System (F)	Max. ESR (at 1 kHz) (Ω)	Max. Current at 30 minutes (mA)
FT0H104Z	5.5	0.10	0.14	less than 16	less than 0.15
FT0H224Z	5.5	0.22	0.28	less than 10	less than 0.33
FT0H474Z	5.5	0.47	0.60	less than 6.5	less than 0.71
FT0H105Z	5.5	1.0	1.3	less than 3.5	less than 1.5
FT0H225Z	5.5	2.2	2.8	less than 1.8	less than 3.3
FT0H335Z	5.5	3.3	4.2	less than 1.0	less than 5.0
FT0H565Z	5.5	5.6	7.2	less than 0.6	less than 8.4

Specifications

Item		Specification		Test Conditions conforming to JIS C 5102-1994
Operating Temperature Range		–40˚C to +85˚C		
Maximum Operating Voltage		5.5 Vdc		
Nominal Capacitance Range		0.1 to 5.6 F (Refer to standard ratings)		
Capacitance Allowance		+80 %, –20 %		See characteristics measuring conditions
Equivalent Series Resistance		See standard list		See characteristics measuring conditions
Current (30-minute value)		See standard list		See characteristics measuring conditions
Surge Voltage		Capacitance	More than 90 % of initial requirement	At 85˚C Surge voltage 6.3 V Charge: 30 sec. Discharge: 9 min. 30 sec. 1000 cycles Charge resistance: 0.10 F 150 Ω 0.22 F 56 Ω 0.47 F 30 Ω 1.0 F 15 Ω 2.2 F 10 Ω 3.3 F 10 Ω 5.6 F 10 Ω Discharge resistance: Not applicable (0 Ω)
		Equivalent Series Resistance	Not to exceed 120 % of initial requirement	
		Current at 30 minutes	Not to exceed 120 % of initial requirement	
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: +85 ±2˚C Phase 6: +25 ±2˚C
		Equivalent Series Resistance	Not to exceed 3 times initial value	
	Phase 3	Capacitance	More than 30 % of initial value	
		Equivalent Series Resistance	Not to exceed 7 times initial value	
	Phase 5	Capacitance	Not to exceed 150 % of initial value	
		Equivalent Series Resistance	Not to exceed initial requirement	
		Current at 30 minutes	Not to exceed 1.5 CV (mA)	
	Phase 6	ΔC/C	Within ±20 % of initial value	
		Equivalent Series Resistance	Not to exceed initial requirement	
		Current at 30 minutes	Not to exceed initial requirement	
Lead Strength (Tensile)		No loosening nor permanent damage of the leads		Conforms to 8.1.2(1) 0.022 to 0.47 F: 1 kg, 10 sec. 1 F: 2.5 kg, 10 sec.
Vibration Resistance		Capacitance	Meet initial requirement	Conforms to 8.2.3 Frequency: 10 to 55 Hz Test duration: 6 hours
		Equivalent Series Resistance	Meet initial requirement	
		Current at 30 minutes	Meet initial requirement	
Solderability		3/4 or more of the pin surface should be covered with new solder		Conforms to 8.4 230 ± 5˚C 5 ± 0.5 sec. 1.6 mm from body
Soldering Heat Resistance		Capacitance	Meet initial requirement	Conforms to 8.5 260 ±10˚C, 10 ±1 sec. Immersion depth: 1.6 mm from body
		Equivalent Series Resistance	Meet initial requirement	
		Current at 30 minutes	Meet initial requirement	
Temperature Cycle		Capacitance	Meet initial requirement	Conforms to 9.3 Temperatuve condition: –40˚C → Normal temperature → +85˚C→ Normal temperature Number of cycles : 5 cycles
		Equivalent Series Resistance	Meet initial requirement	
		Current at 30 minutes	Meet initial requirement	
Humidity Resistance		Capacitance	Within ± 20% of initial value	Conforms to 9.5 40 ± 2˚C, 90 to 95% RH 240 ± 8 hours
		Equivalent Series Resistance	Not to exceed120 % of initial requirement	
		Current at 30 minutes	Not to exceed120 % of initial requirement	
High temperature Load		Capacitance change	Within ±30% of initial value	Conforms to 9.10 Temperature: 85 ± 2˚C Series resistance: 0Ω Applied voltage: 5.5 VDC Time of test: 1000 hours
		Equivalent Series Resistance	Not to exceed 200% of initial requirement	
		Current at 30 minutes	Not to exceed 200% of initial requirement	