

# FC Series

## Features

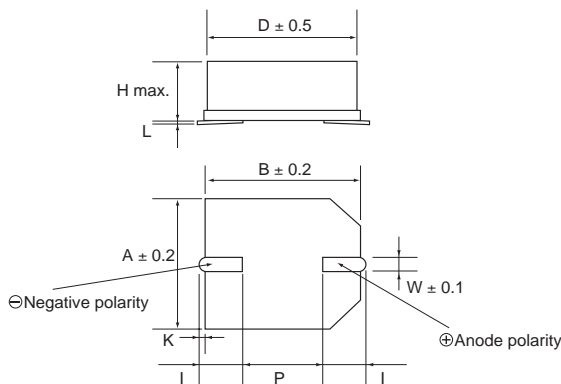
- Enables surface mounting.
- High rated voltage of 5.5V.
- High reliability solution leakage.

## Applications

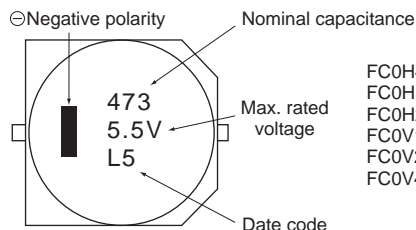
- Subsidiary power supply.  
Buck up power supply line.  
Memory backup during battery exchange.

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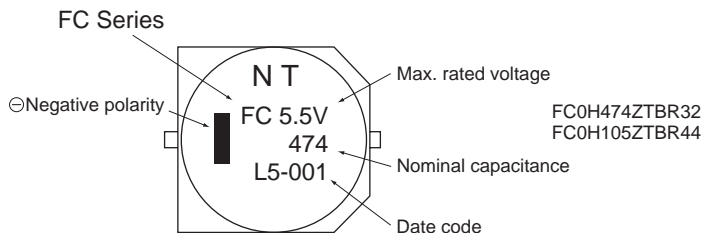
## Dimensions



## Markings



FC0H473ZTBR24  
FC0H104ZTBR24  
FC0H224ZTBR24  
FC0V104ZTBR24  
FC0V224ZTBR24  
FC0V474ZTBR24



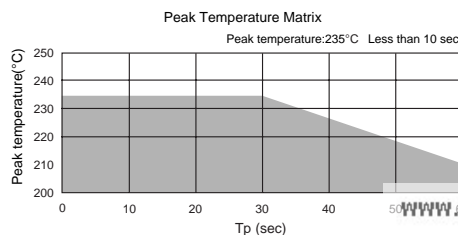
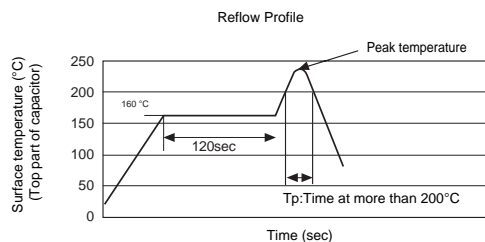
## Standard Rating

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 <sup>+0.3</sup> <sub>-0.1</sub>
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 <sup>+0.3</sup> <sub>-0.1</sub>
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 <sup>+0.3</sup> <sub>-0.1</sub>
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 <sup>+0.5</sup> <sub>-0.1</sub>
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 <sup>+0.5</sup> <sub>-0.1</sub>
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 <sup>+0.3</sup> <sub>-0.1</sub>
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 <sup>+0.3</sup> <sub>-0.1</sub>
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 <sup>+0.3</sup> <sub>-0.1</sub>

## 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 at the left, "Reflow Condition" indicates the surface temperature at the top of capacitor.

- Reflow Condition

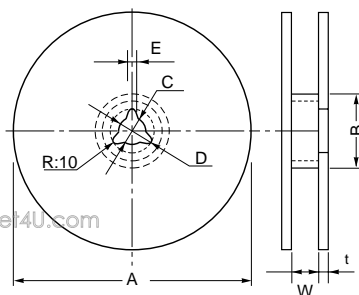


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## Tape and Reel Dimensions

[Reel Dimensions]

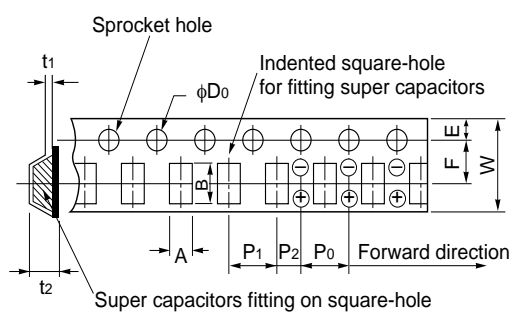
(mm)



Mark	TBR24	TBR32	TBR44
A	380±2	330±2	380±2
B	Product height 5.5mm	80±1	100±1
	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
	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 <sub>0</sub>	4.0	4.0	4.0
P <sub>1</sub>	16.0	24.0	32.0
P <sub>2</sub>	2.0	2.0	2.0
F	11.5	14.2	20.2
φD <sub>0</sub>	1.55	1.55	1.55
t <sub>1</sub>	0.4	0.5	0.5
E	1.75	1.75	1.75
t <sub>2</sub>	5.8	10.0	12.0

Number of packaged 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 Voltage <sub>20</sub>		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	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		
	* Vibration Resistance		Capacitance		
Equivalent series resistance					
Current (30-minute value)					
Appearance			No obvious abnormality		
* 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			
* 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			
* 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 obvious 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 <sup>+48</sup> <sub>0</sub> 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 Discharge )		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 <sup>-1994</sup>
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
		Equivalent series resistance	4 or less times initial value	
	Phase 5	Capacitance	200% or below of initial value	Phase 1: +25 ± 2°C
		Equivalent series resistance	Satisfy initial standard value	Phase 2: -25 ± 2°C
		Current (30-minute value)	1.5 CV (mA) or below	Phase 3: -40 ± 2°C
	Phase 6	Capacitance	Within ±20% of initial value	Phase 4: +25 ± 2°C
		Equivalent series resistance	Satisfy initial standard value	Phase 5: +70 ± 2°C
		Current (30-minute value)	Satisfy initial standard value	Phase 6: +25 ± 2°C
		Appearance	No obvious abnormality	
* Vibration Resistance	Capacitance	Satisfy initial standard value	Conforms to 8.2.3	
	Equivalent series resistance			
	Current (30-minute value)			
	Appearance	No obvious abnormality		Frequency : 10 to 55 Hz Test duration : 6 hours
* Soldering Heat Resistance	Capacitance	Satisfy initial standard value	Conforms to 8.5	
	Equivalent series resistance			
	Current (30-minute value)			
	Appearance	No obvious able abnormality		Solder temperature: 260 ± 10°C Dipping duration: 10 ± 1 sec. Dipped up to 1.6 mm from the lower end of the capacitor.
* Temperature Cycle	Capacitance	Satisfy initial standard value	Conforms to 9.3	
	Equivalent series resistance			
	Current (30-minute value)			
	Appearance	No obvious abnormality		Temperature condition: -25°C → normal temperature → +70°C → normal temperature Number of cycles: 5 cycles
* Humidity Resistance	Capacitance	Within 20% of initial value	Conforms to 9.5	
	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		Temperature: 40 ± 2°C Relative humidity: 90 to 95% RH Test duration: 240 ± 8 hours
* High Temperature Load	Capacitance	Within 30% of initial value	Conforms to 9.10	
	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		Temperature: 70 ± 2°C Voltage applied: 3.5 Vdc Series protection resistance: 0 Ω Test duration: 1000 <sup>+48</sup> <sub>0</sub> hours

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