

DATASHEET

# GF & HF Coin Cell Supercapacitor

Revision 2.6 Mar 2024

- Long lifetimes
- High operating temperature up to 85°C



## Electrical Specifications

Item (condition)	Specification	
Rated Voltage	5.5V	
GF - Operating Temperature Range	-25°C to +70°C	
GF – Endurance (5.5V 70°C 1000hrs)	Final ESR ≤ 500% initial ESR	Final C ≥ 60% initial C
GF – Temperature variation (-25°C to + 70°C)	ΔC ≤ 30% of 25°C value	ΔESR ≤ 500% of 25°C value
HF - Operating Temperature Range	-40°C to +85°C	
HF – Endurance (5.5V 85°C 1000hrs)	Final ESR ≤ 500% initial ESR	Final C ≥ 70% initial C
HF – Temperature variation (-40°C to + 85°C)	ΔC ≤ 50% of 25°C value	ΔESR ≤ 700% of 25°C value

## Part numbering code

x	F	N	vvv	dd	ll	S	ccc	R
Model	Coin cell	# of cells	Voltage	Diameter (mm)	Thickness (mm)	Tolerance	Capacitance (μF)	Lead format
G, H		1	5R5 = 5.5V	11 = 11.5 13 = 13.5 19 = 19 20 = 20.5	05 = 4.8 07 = 7.0 08 = 8.0 09 = 9.0 10 = 9.8	P(+80%/-20%) O(+80%/0%) V(+30%/-10%)	Two digits + number of zeros. 155 = 1500000μF = 1.5F	V, H, C refer to mechanical drawings

GF & HF Coin Cell Supercapacitor

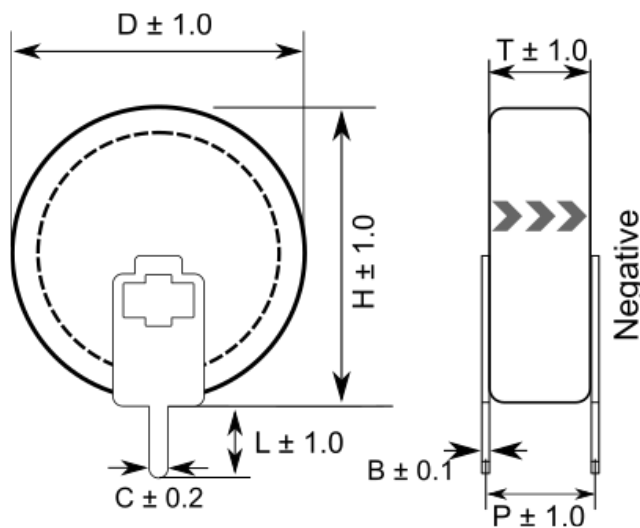
**GF Product Range, V Type**

Temperature Range: -25°C to +70°C

Parameters measured at 25°C

CAP-XX Part no.	Cap (F)	AC ESR Max @1kHz (Ω)	IL max @ 72Hrs (μA)	Dimensions (mm)						
				D	T	H	P	L	C	B
GF15R51105P224V	0.22	75	5	11.5	4.8	13	5	3.5	0.8	0.2
GF15R51105P334V	0.33	50	8	11.5	4.8	13	5	3.5	0.8	0.2
GF15R51105P474V	0.47	50	8	11.5	4.8	13	5	3.5	0.8	0.2
GF15R51905P105V	1	30	12	19	4.8	20.5	5	5	1	0.2
GF15R51905P155V	1.5	30	12	19	4.8	20.5	5	5	1	0.2

Mechanical drawing, all units in mm:



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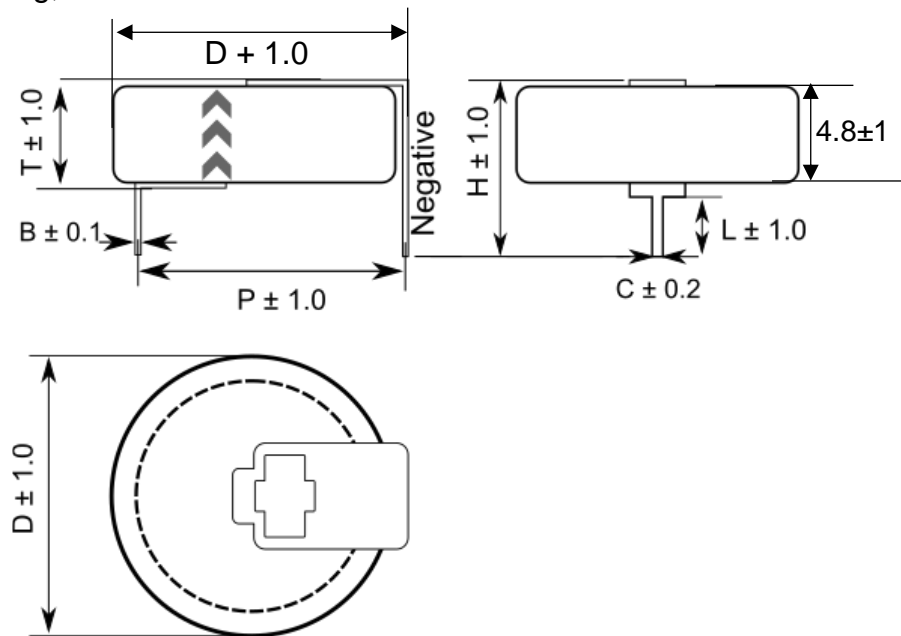
**GF Product Range, H Type**

Temperature Range: -25°C to +70°C

Parameters measured at 25°C

CAP-XX Part no.	Cap (F)	AC ESR Max @1kHz (Ω)	IL max @ 72Hrs (μA)	Dimensions (mm)						
				D	T	H	P	L	C	B
GF15R51105P224H	0.22	75	5	11.5	6	9	10	3	0.8	0.2
GF15R51105P334H	0.33	50	8	11.5	6	9	10	3	0.8	0.2
GF15R51105P474H	0.47	50	8	11.5	6	9	10	3	0.8	0.2
GF15R51905P105H	1	30	12	19	7	9.5	20	2.5	1	0.2
GF15R51905P155H	1.5	30	12	19	7	9.5	20	2.5	1	0.2

Mechanical drawing, all units in mm:



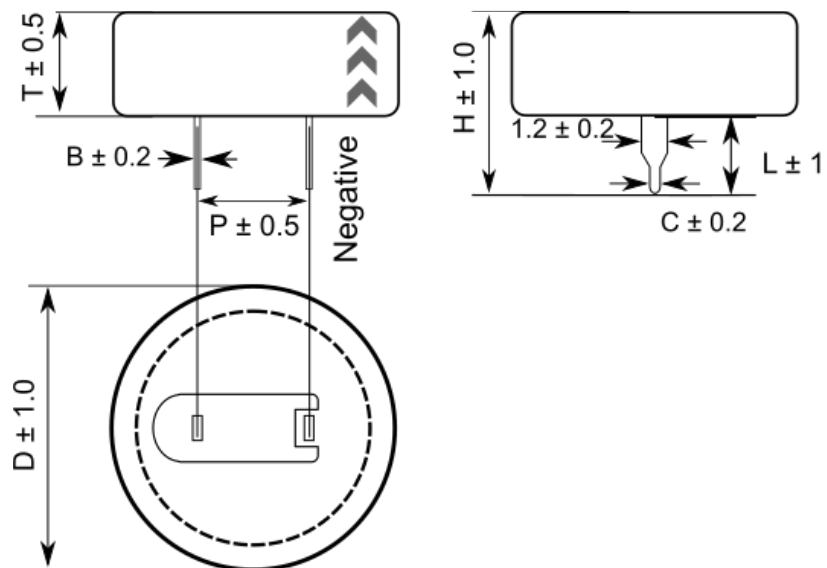
## GF Product Range, C Type

Temperature Range: -25°C to +70°C

Parameters measured at 25°C

CAP-XX Part no.	Cap (F)	AC ESR Max @1kHz (Ω)	IL max @ 72Hrs (μA)	Dimensions (mm)						
				D	T	H	P	L	C	B
GF15R51307P224C	0.22	75	5	13.5	7	13.2	5	6	0.8	0.4
GF15R51307P334C	0.33	50	8	13.5	7	13.2	5	6	0.8	0.4
GF15R51307P474C	0.47	50	8	13.5	7	13.2	5	6	0.8	0.4
GF15R52008P105C	1	30	12	20.5	7.8	13.8	5	6	0.8	0.5
GF15R52008P155C	1.5	30	12	20.5	7.8	13.8	5	6	0.8	0.5

Mechanical drawing, all units in mm:



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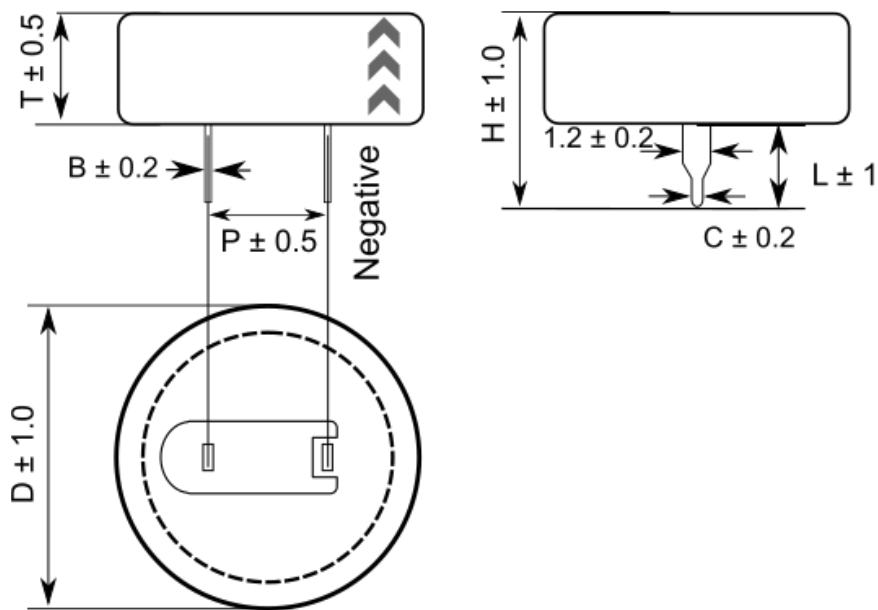
### HF Product Range, C Type

Temperature Range: -40°C to +85°C

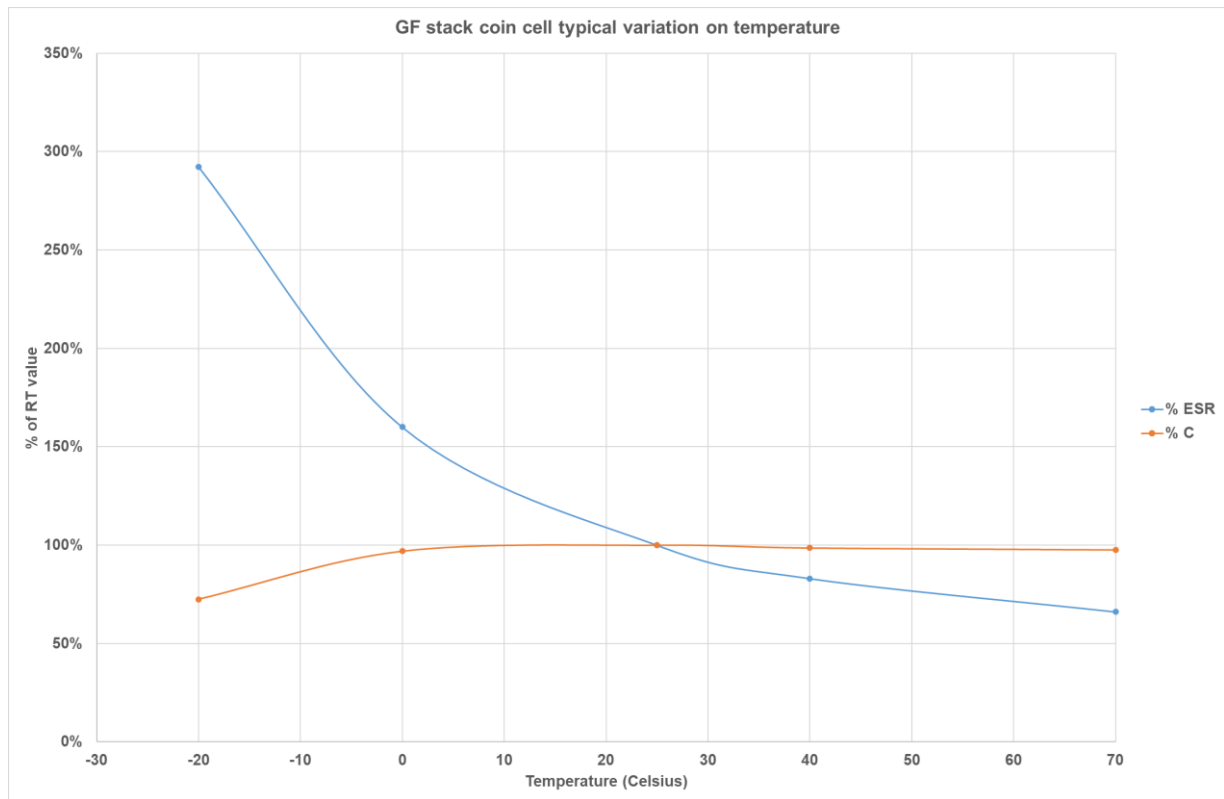
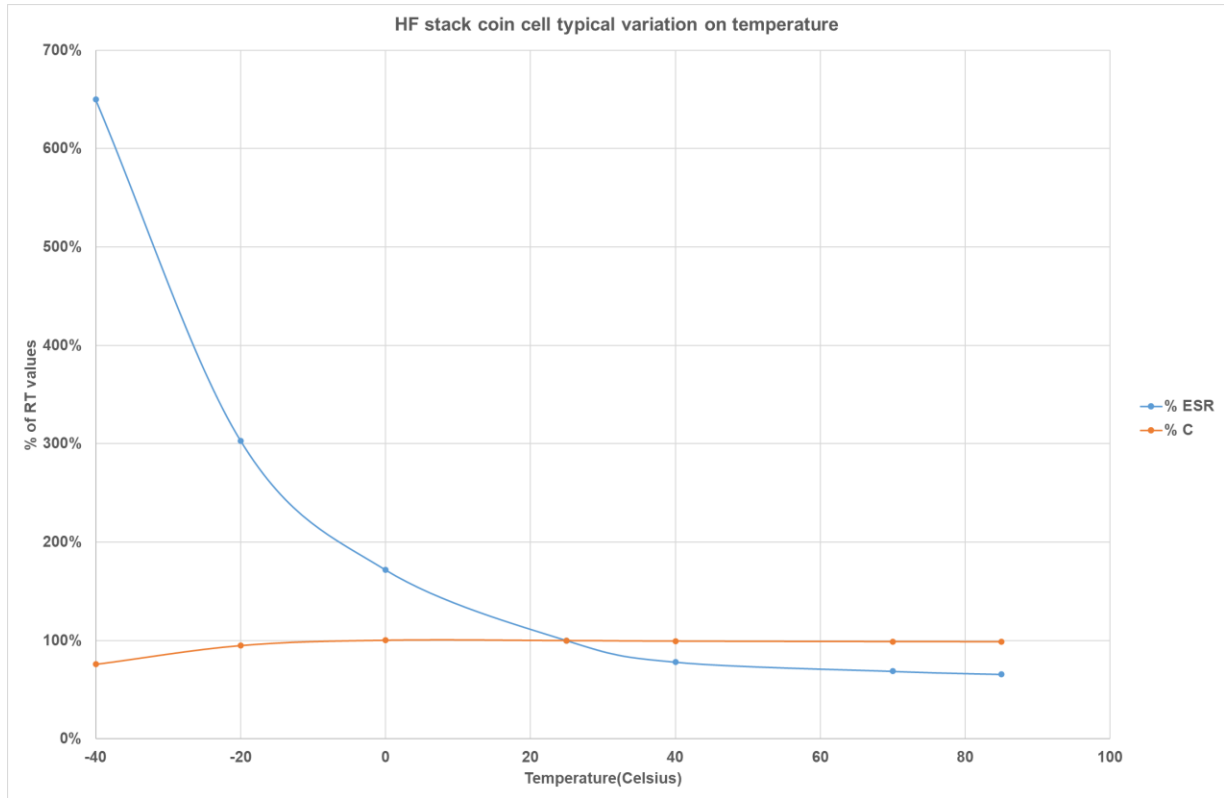
Parameters measured at 25°C

CAP-XX Part no.	Cap (F)	AC ESR Max @1kHz (Ω)	IL max @ 72Hrs (μA)	Dimensions (mm)						
				D	T	H	P	L	C	B
HF15R51309P104C	0.1	75	5	13.5	9	15.5	5	6	0.8	0.5
HF15R51309P224C	0.22	75	5	13.5	9	15.5	5	6	0.8	0.5
HF15R51309P334C	0.33	50	8	13.5	9	15.5	5	6	0.8	0.5
HF15R52010P684C	0.68	30	15	20.5	9.8	16	5	6	0.8	0.5
HF15R52010P105C	1	30	15	20.5	9.8	16	5	6	0.8	0.5

Mechanical drawing, all units in mm:



## Variation in DC Capacitance and ESR with temperature



## Storage

CAP-XX recommends storing supercapacitors in their original packaging in an air conditioned room, preferably at < 30°C and < 50% relative humidity. CAP-XX supercapacitors can be stored at any temperature not exceeding their maximum operating temperature but storage at continuous high temperature and humidity is not recommended and will cause premature ageing.

Do not store supercapacitors in the following environments:

- High temperature / high humidity
- Direct sunlight
- In direct contact with water, salt, oil or other chemicals
- In direct contact with corrosive materials, acids, alkalis or toxic gases
- Dusty environment
- In environments subjected to shock and vibration

## Soldering

When soldering it is important to not over-heat the supercapacitor to not adversely affect its performance. CAP-XX recommends that only the leads come in contact with solder and not the supercapacitor body.

### Hand Soldering

Heat transfers from the leads into to the supercapacitor body, so the soldering iron temperature should be < 350°C soldering time should be kept to the minimum possible and be less than 4 seconds.

### Wave Soldering

The PCB should be pre-heated only from the bottom and for < 60 secs with temperature ≤ 100°C on the top side of the board for PCBs ≥ 0.8mm thick. The table below lists suggested solder temperatures.

Solder temperature °C	Suggested solder time (s)
220	7
240	7
250	5
260	3

### Reflow Soldering

Do not use reflow soldering on this family of product.

## Transportation

All the supercapacitor cells in this datasheet store < 0.3Wh energy. The energy in watt-hours is calculated as:  $\frac{1}{2} \times \text{Capacitance} \times V_{\text{rated}}^2 / 3600$ . The largest cell in this range is 100F, so stored energy =  $\frac{1}{2} \times 100 \times 2.7^2 / 3600 = 0.101\text{Wh}$ . Under regulation UN3499 there is no restriction on shipping these supercapacitors. Their shipping description is “Electrical Capacitors” with harmonized shipping code 8532.29.0040.