

COIN TYPE LITHIUM BATTERIES

Poly-carbonmonofluoride (BR series) /Manganese dioxide (CR series) Lithium batteries



Overview

The Panasonic coin type lithium primary battery is a high-energy, high-density battery resulting from our extensive experience in battery technology. Provided with outstanding features, which conventional dry batteries cannot attain, this battery has a broad range of applications, such as the main power supply of clocks/watches and electronic notebooks, and the memory backup power supply for C-MOS RAM memories and microcomputer IC memories.

Panasonic meets different market needs with two types (30 sizes) of the product offering a wide capacity range (18mAh to 1000mAh):

1. Poly-carbonmonofluoride lithium batteries (BR series) which exhibit stable performance at comparatively high environment temperatures.
2. Manganese dioxide lithium batteries (CR series) which show excellence in comparatively large current applications like the alarm actuation in watches.

Features

- **Voltage about twice that of dry batteries**
The nominal voltage is as high as 3 V, approximately twice that of manganese and alkaline button batteries. A single lithium battery can replace two or three conventional batteries.
- **Excellent storability with minimal deterioration**
Minimal deterioration is not necessarily an inherent feature of lithium batteries. It is achieved by using chemically stable materials and superior production methodologies and sealing techniques. Panasonic coin type lithium batteries show an annual deterioration rate as low as about 1.0% at room temperature, meeting the requirement for a room-temperature storage period of more than 10 years.
- **Wide operating temperature range (-40°C to 85°C (-40°F to 185°F))**
Organic solvents are used for the electrolyte in lithium batteries. Therefore, the solidifying point of

this electrolyte is much lower than that of the aqueous solution type electrolyte in manganese batteries, etc., enabling the use of lithium batteries in low-temperature regions. Panasonic coin type lithium batteries are mostly operable over the temperature range from -40°C to 85°C (-40°F to 185°F).

- **Strong leakage resistance**
The organic electrolyte liquid used in lithium batteries shows minimal creep. This feature, and our unique sealing technique, give our batteries very strong leakage resistance.
- **UL-recognized product**
Panasonic coin type lithium batteries have all acquired the component recognition of UL (Underwriters Laboratories Inc.) in U.S..(File No. MH12210)

SPECIFICATION TABLE

Poly-carbonmonofluoride (BR series) Lithium batteries

Model No.	JIS	IEC	Electrical characteristics 20°C (68°F)			Dimensions (Max.)		Approx. weight g (oz)
			Nominal voltage (V)	Nominal ^{*1} capacity (mAh)	Continuous drain Standard (mA)	Diameter mm(inch)	Height mm(inch)	
BR1216	---	---	3	25	0.03	12.5 (0.49)	1.60 (0.06)	0.6 (0.02)
BR1220	---	---	3	35	0.03	12.5 (0.49)	2.00 (0.08)	0.7 (0.02)
BR1225	---	BR1225	3	48	0.03	12.5 (0.49)	2.50 (0.10)	0.8 (0.03)
BR1616	---	---	3	48	0.03	16.0 (0.63)	1.60 (0.06)	1.0 (0.04)
BR1632	---	---	3	120	0.03	16.0 (0.63)	3.20 (0.13)	1.5 (0.05)
BR2016	---	BR2016	3	75	0.03	20.0 (0.79)	1.60 (0.06)	1.5 (0.05)
BR2020	---	BR2020	3	100	0.03	20.0 (0.79)	2.00 (0.08)	2.0 (0.07)
BR2032	---	---	3	190	0.03	20.0 (0.79)	3.20 (0.13)	2.5 (0.09)
BR2320	---	BR2320	3	110	0.03	23.0 (0.91)	2.00 (0.08)	2.5 (0.09)
BR2325	---	BR2325	3	165	0.03	23.0 (0.91)	2.50 (0.10)	3.2 (0.11)
BR2330	---	---	3	255	0.03	23.0 (0.91)	3.00 (0.12)	3.2 (0.11)
BR3032	---	BR3032	3	500	0.03	30.0 (1.18)	3.20 (0.13)	5.5 (0.19)

* 1 Nominal capacity shown above is based on standard drain and cut off voltage down to 2.0 V at 20°C (68°F)

Manganese dioxide (CR series) Lithium batteries

Model No.	JIS	IEC	Electrical characteristics 20°C (68°F)			Dimensions (Max.)		Approx. weight g (oz)
			Nominal voltage (V)	Nominal ^{*1} capacity (mAh)	Continuous drain Standard (mA)	Diameter mm(inch)	Height mm(inch)	
CR1025	CR1025	CR1025	3	30	0.10	10.0 (0.39)	2.50 (0.10)	0.7 (0.02)
CR1212 ^{*2}	---	---	3	18	0.10	12.5 (0.49)	1.20 (0.05)	0.5 (0.02)
CR1216	CR1216	CR1216	3	25	0.10	12.5 (0.49)	1.60 (0.06)	0.7 (0.02)
CR1220	CR1220	CR1220	3	35	0.10	12.5 (0.49)	2.00 (0.08)	1.2 (0.04)
CR1612	---	---	3	40	0.10	16.0 (0.63)	1.20 (0.05)	0.8 (0.03)
CR1616	CR1616	CR1616	3	55	0.10	16.0 (0.63)	1.60 (0.06)	1.2 (0.04)
CR1620	---	CR1620	3	75	0.10	16.0 (0.63)	2.00 (0.08)	1.3 (0.05)
CR1632	---	---	3	125	0.10	16.0 (0.63)	3.20 (0.13)	1.8 (0.06)
CR2012	CR2012	CR2012	3	55	0.10	20.0 (0.79)	1.20 (0.05)	1.4 (0.05)
CR2016	CR2016	CR2016	3	90	0.10	20.0 (0.79)	1.60 (0.06)	1.6 (0.06)
CR2025	CR2025	CR2025	3	165	0.20	20.0 (0.79)	2.50 (0.10)	2.5 (0.09)
CR2032	CR2032	CR2032	3	220	0.20	20.0 (0.79)	3.20 (0.13)	3.1 (0.11)
CR2320	CR2320	CR2320	3	130	0.20	23.0 (0.91)	2.00 (0.08)	3.0 (0.11)
CR2330	CR2330	CR2330	3	265	0.20	23.0 (0.91)	3.00 (0.12)	4.0 (0.14)
CR2354	---	CR2354	3	560	0.20	23.0 (0.91)	5.40 (0.21)	5.9 (0.21)
CR2412	---	---	3	100	0.20	24.5 (0.96)	1.20 (0.05)	2.0 (0.07)
CR2477	---	---	3	1000	0.20	24.5 (0.96)	7.70 (0.30)	10.5 (0.37)
CR3032	---	CR3032	3	500	0.20	30.0 (1.18)	3.20 (0.13)	7.1 (0.25)

* 1 Nominal capacity shown above is based on standard drain and cut off voltage down to 2.0 V at 20°C (68°F)

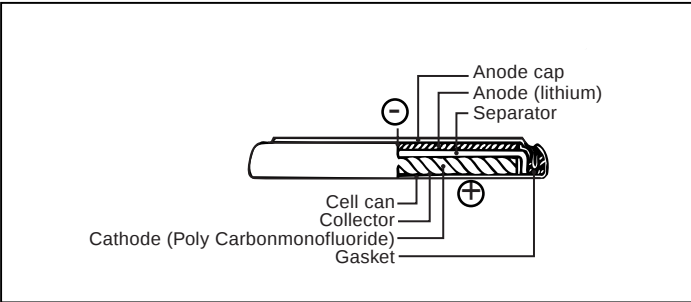
* 2 Under Development

COIN TYPE LITHIUM BATTERIES - CONTINUED

Applications

- Electronic watches (digital and analog)
 - Memory backup for all types of devices (with tab terminal)
 - Calculators, cameras, and electronic notebooks
- Electronic clinical thermometers
 - Other compact, low power cordless equipment

Cutaway view (BR type)



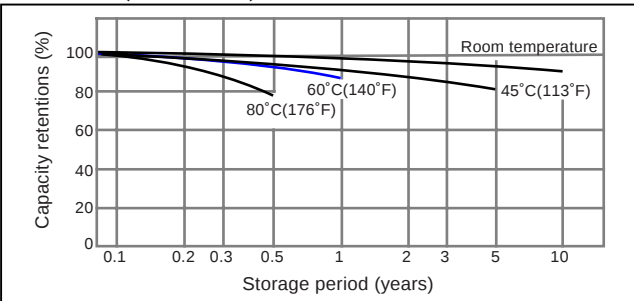
Coin type lithium batteries: size and model number

Diameter mm (inch) Height mm (inch)	30 (1.18)	24.5 (0.96)	23 (0.91)	20 (0.79)	16 (0.63)	12.5 (0.49)	10 (0.39)
7.7 (0.30)		CR2477					
5.4 (0.21)			CR2354				
3.2 (0.13)	BR3032 CR3032			BR2032 CR2032	BR1632 CR1632		
3.0 (0.12)			BR2330 CR2330				
2.5 (0.10)			BR2325	CR2025		BR1225	CR1025
2.0 (0.08)			BR2320 CR2320	BR2020	CR1620	BR1220 CR1220	
1.6 (0.06)				BR2016 CR2016	BR1616 CR1616	BR1216 CR1216	
1.2 (0.05)		CR2412		CR2012	CR1612	Δ CR1212	

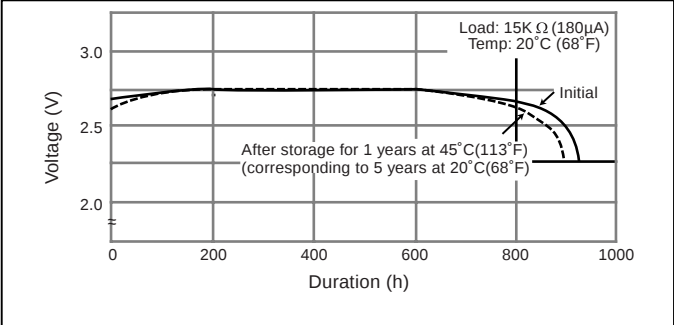
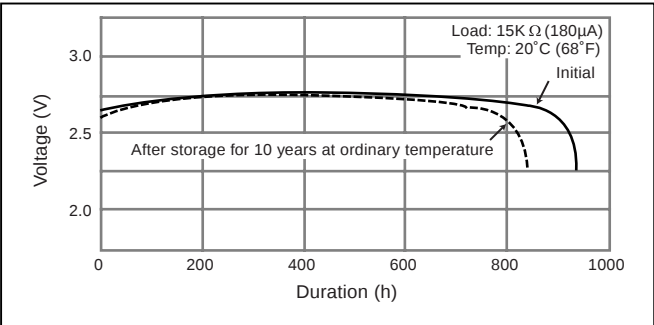
Δ Under development

Characteristics

Shelf life (BR series)



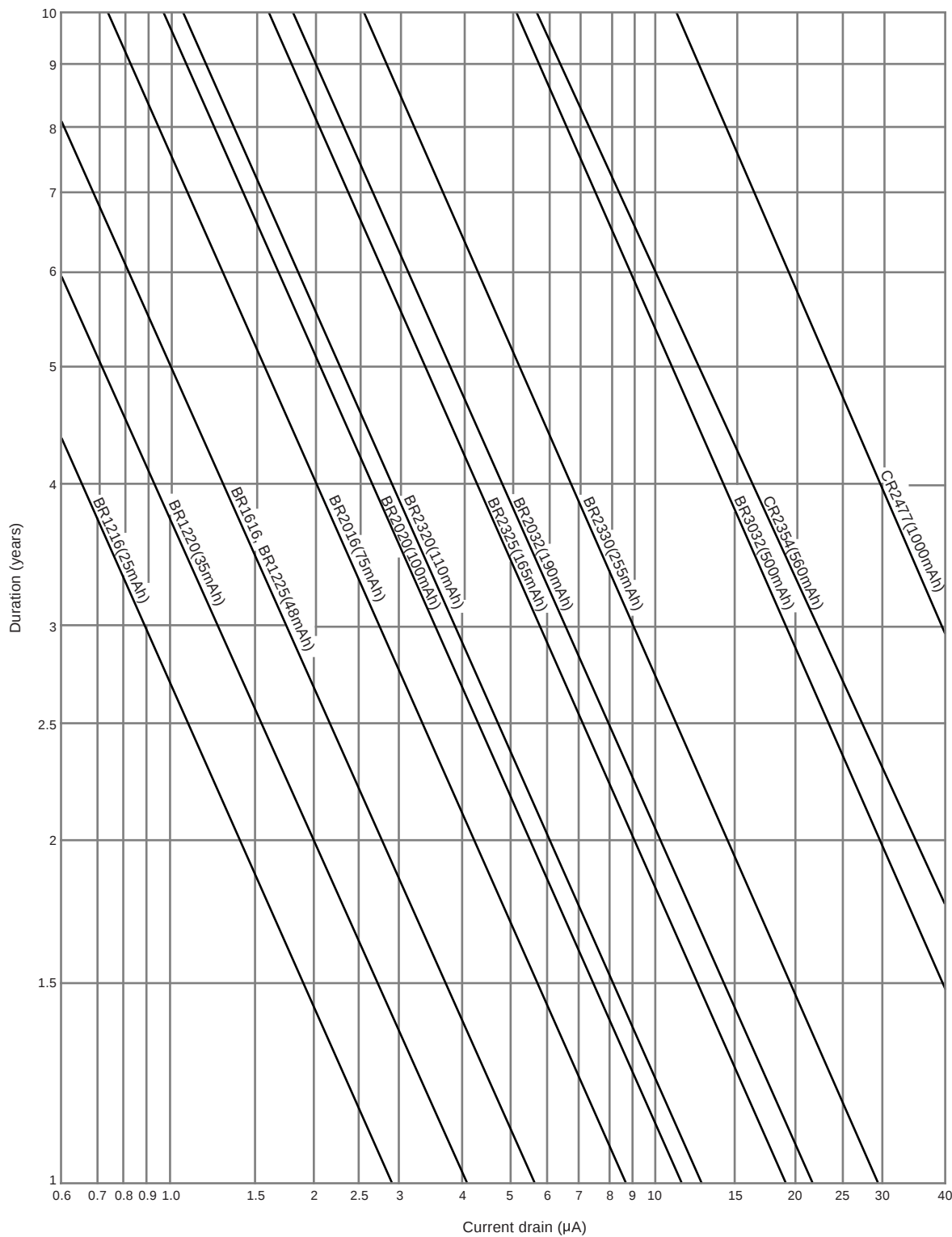
Storage characteristics (BR2325)



BATTERY SELECTOR CHART

Discharge life as a function of operating current

Temp: 20°C(68°F)
Cut off voltage: 2.0V

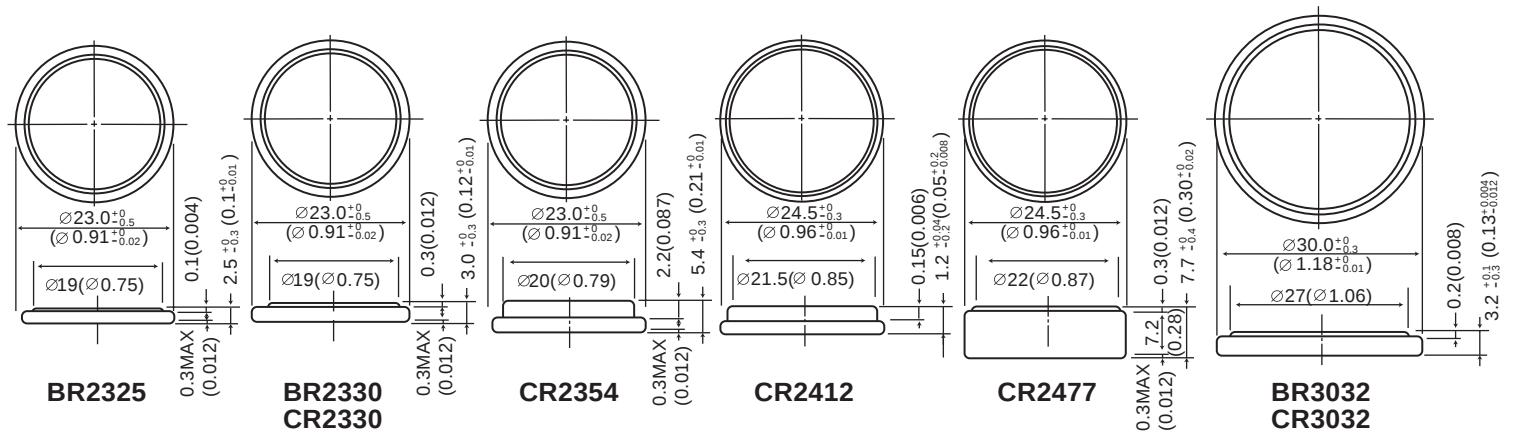
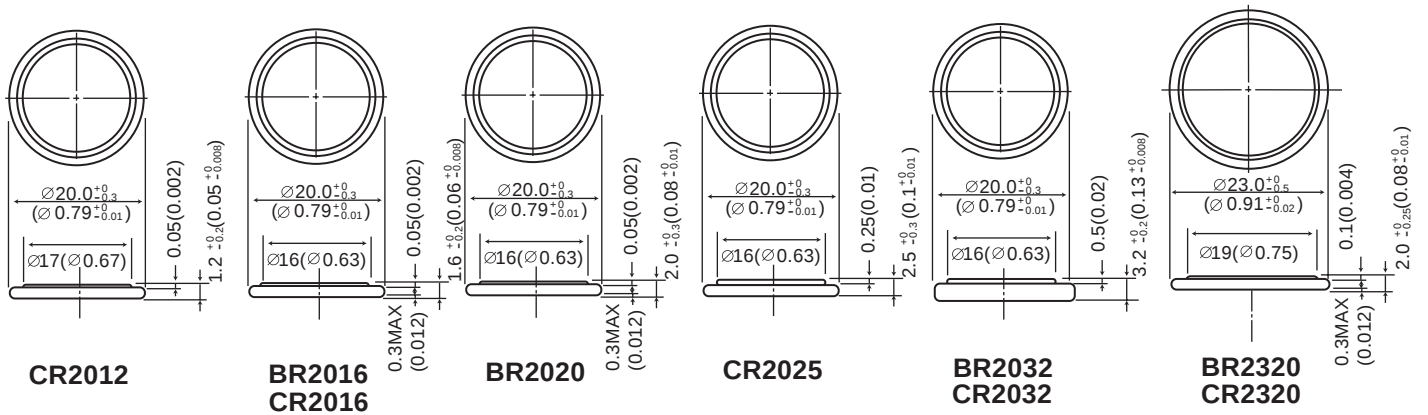
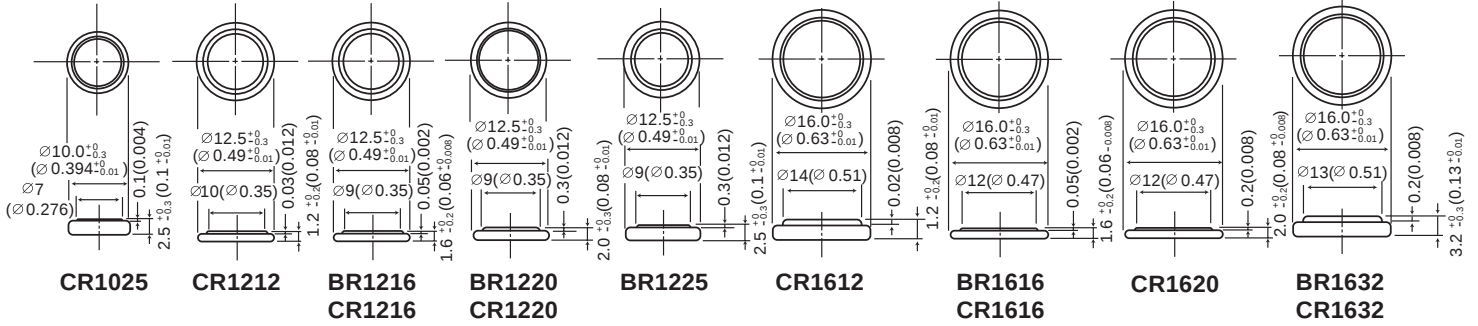
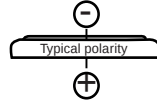


Formula:

$$\text{Duration (years)} = \frac{\text{Nominal capacity (mAh)}}{\text{Current drain (mA)} \times 24 \text{ (hours)} \times 365 \text{ (days)}}$$

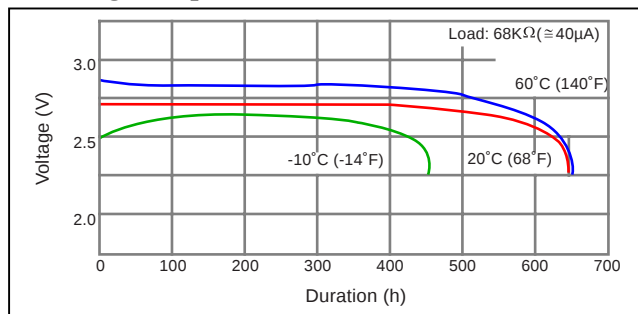
DIMENSIONS MM (INCH)

The dimension data with no tolerance indicated are standard reference values.

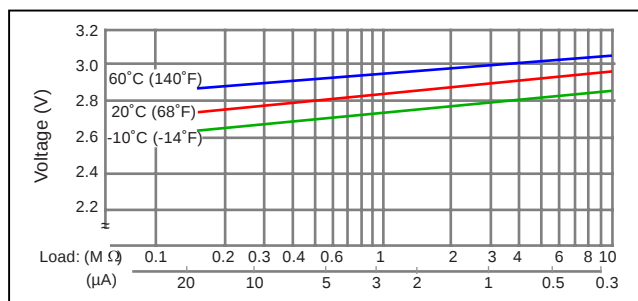


BR1216

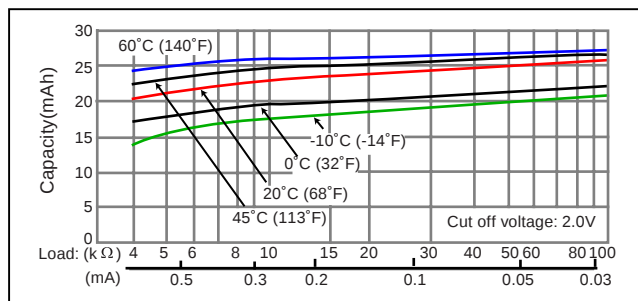
Discharge temperature characteristics



Operating voltage vs. load resistance

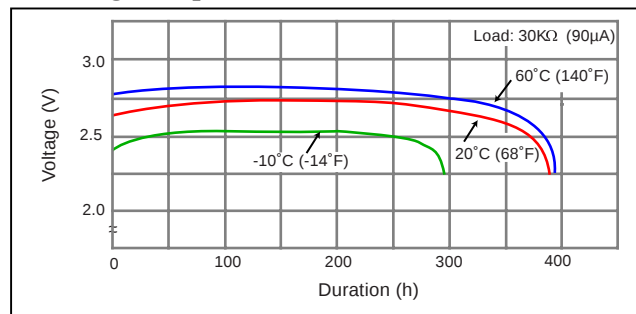


Capacity vs. load resistance

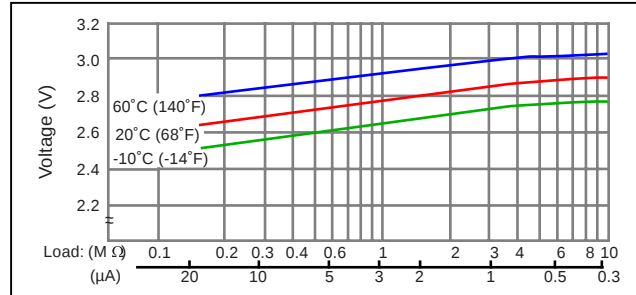


BR1220

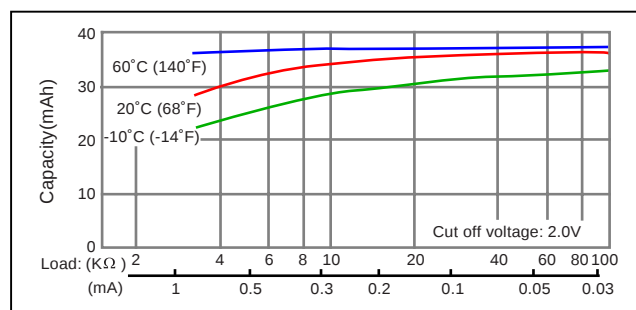
Discharge temperature characteristics



Operating voltage vs. load resistance

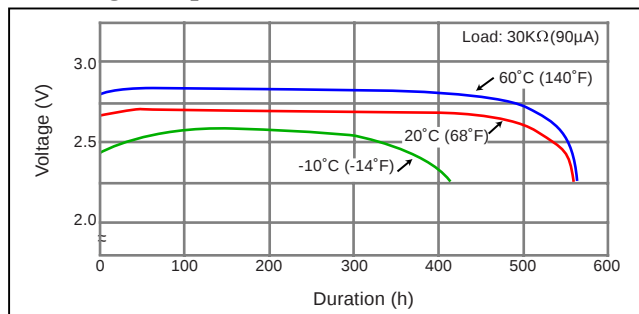


Capacity vs. load resistance

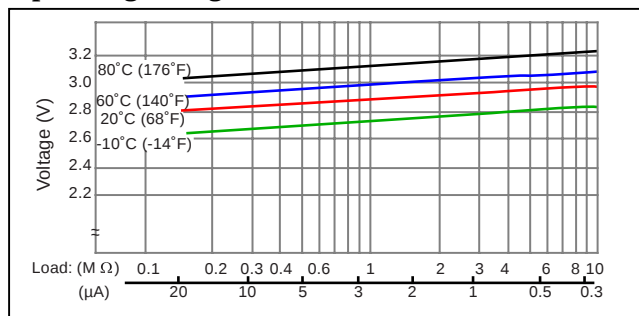


BR1225

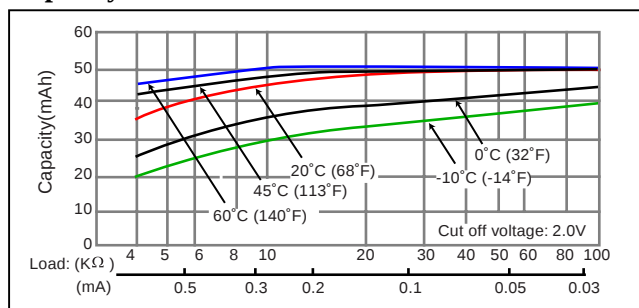
Discharge temperature characteristics



Operating voltage vs. load resistance

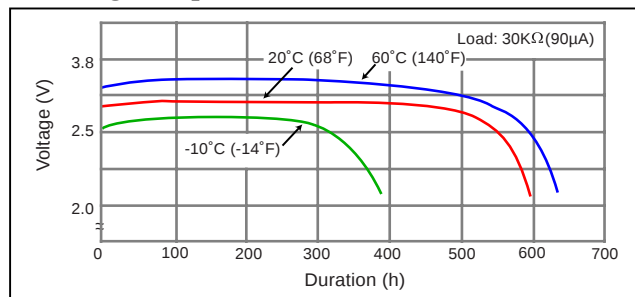


Capacity vs. load resistance

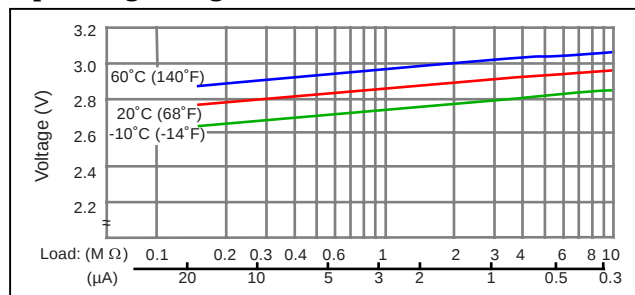


BR1616

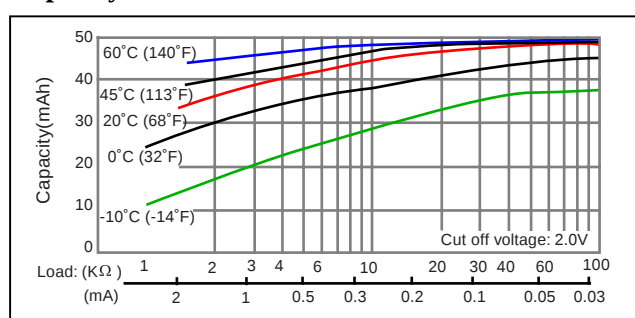
Discharge temperature characteristics



Operating voltage vs. load resistance

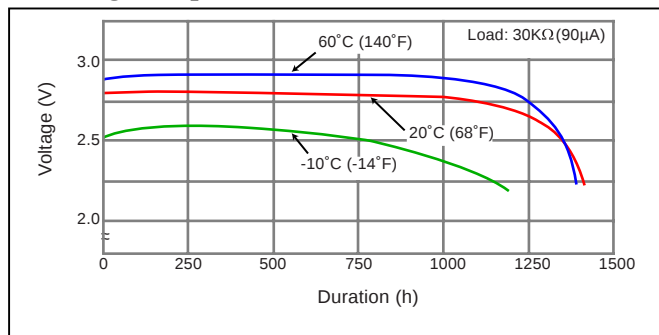


Capacity vs. load resistance

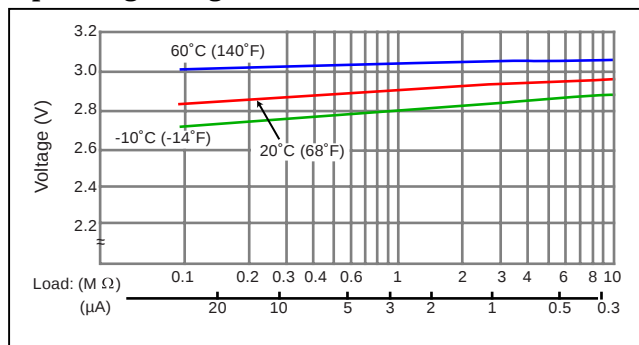


BR1632

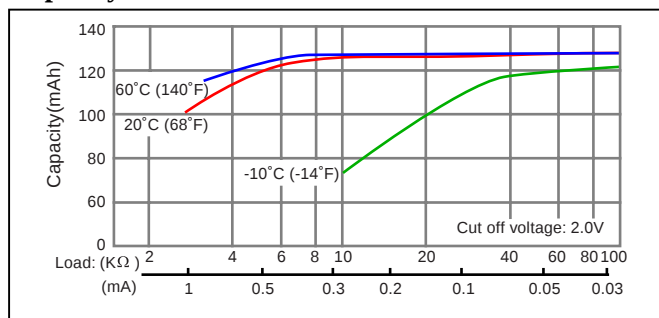
Discharge temperature characteristics



Operating voltage vs. load resistance

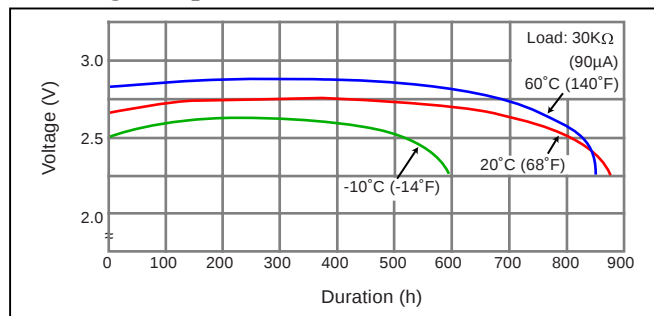


Capacity vs. load resistance

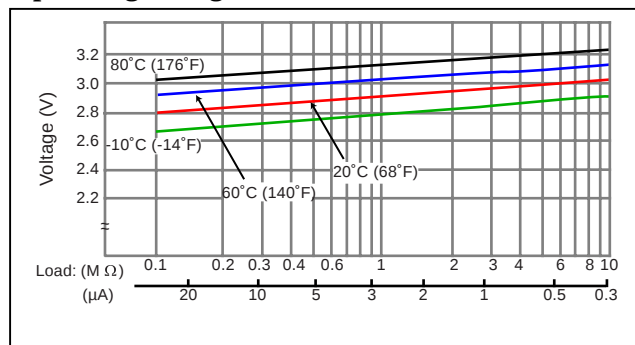


BR2016

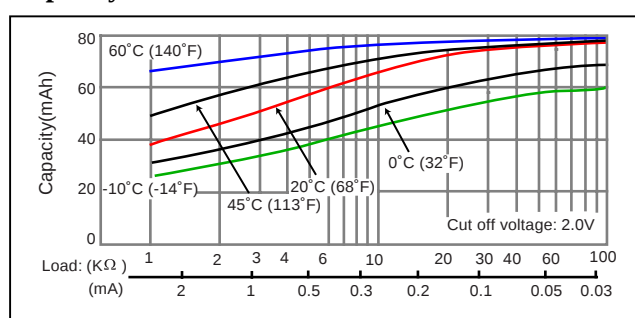
Discharge temperature characteristics



Operating voltage vs. load resistance

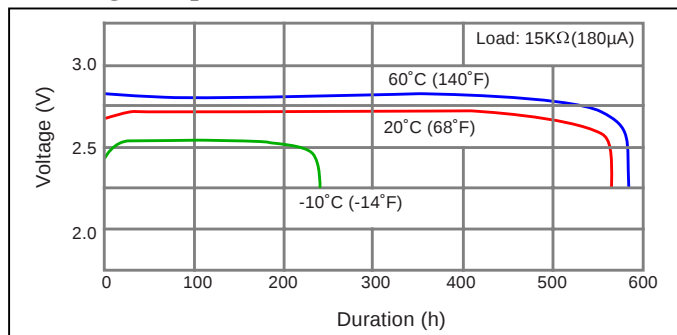


Capacity vs. load resistance

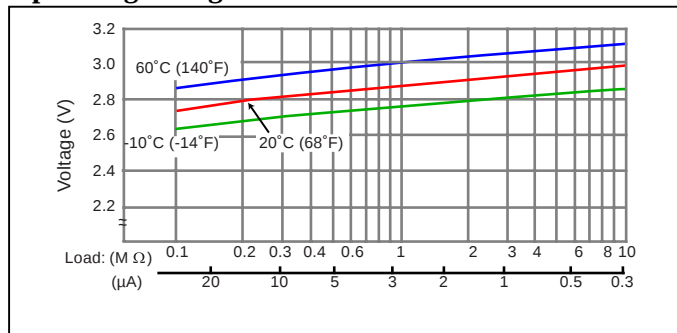


BR2020

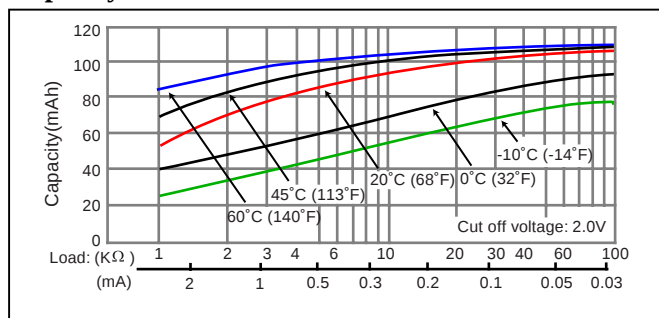
Discharge temperature characteristics



Operating voltage vs. load resistance

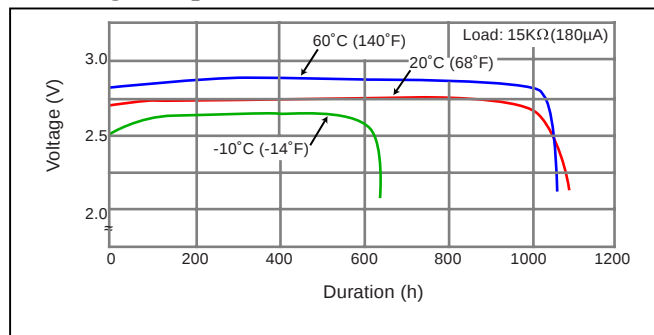


Capacity vs. load resistance

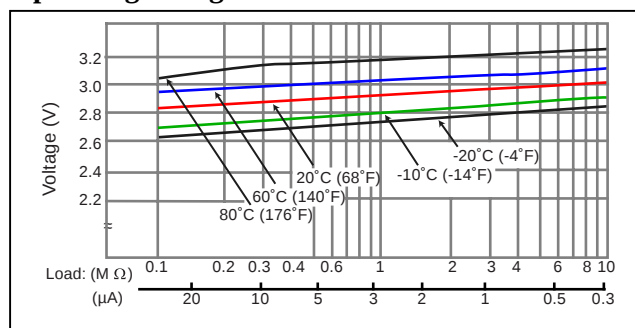


BR2032

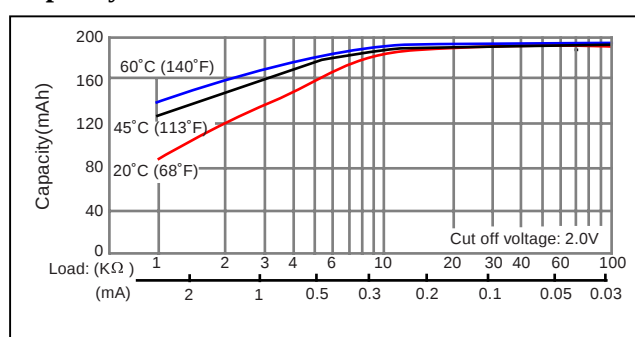
Discharge temperature characteristics



Operating voltage vs. load resistance

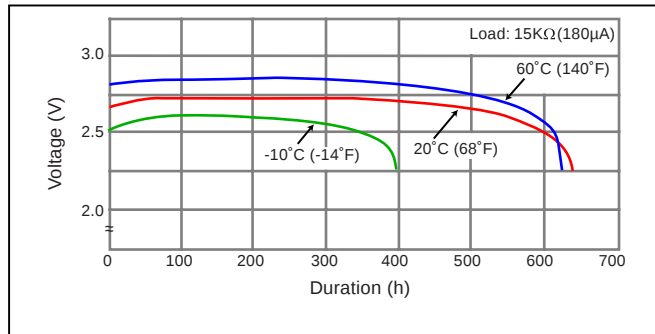


Capacity vs. load resistance

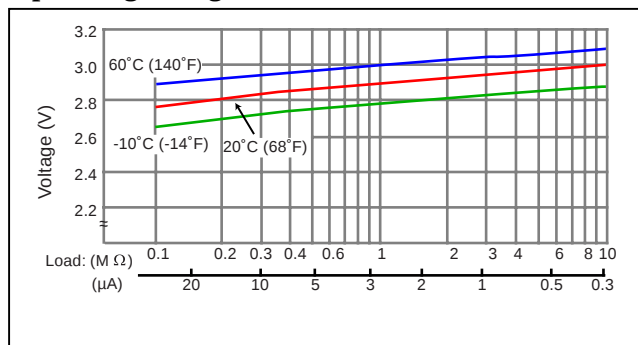


BR2320

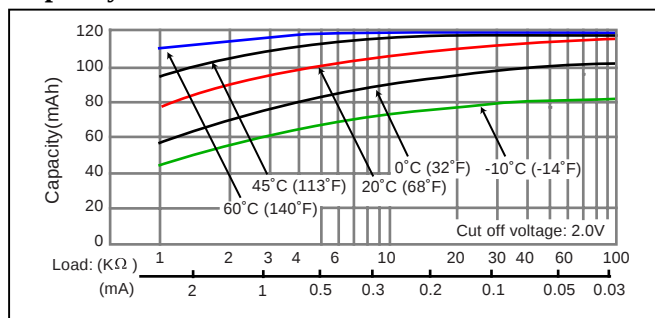
Discharge temperature characteristics



Operating voltage vs. load resistance

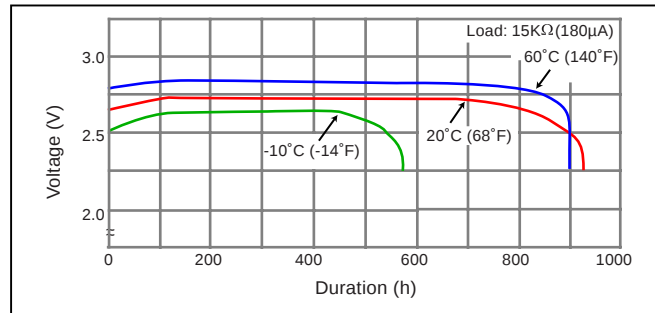


Capacity vs. load resistance

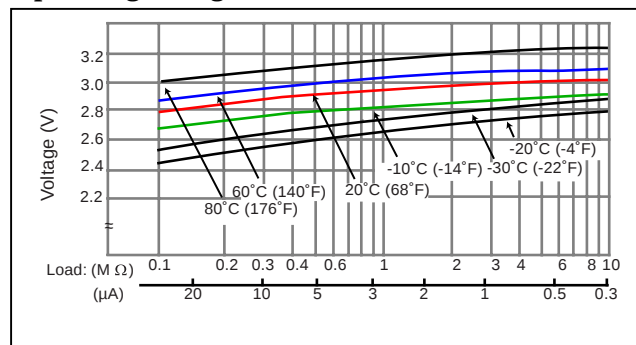


BR2325

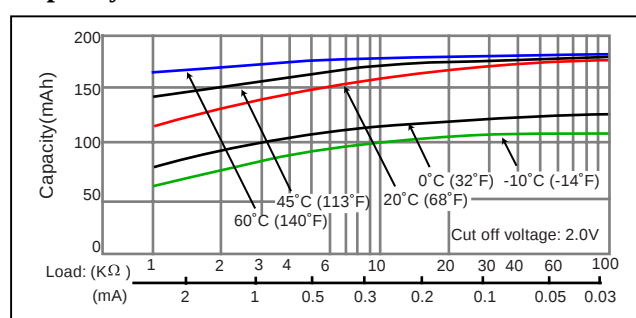
Discharge temperature characteristics



Operating voltage vs. load resistance

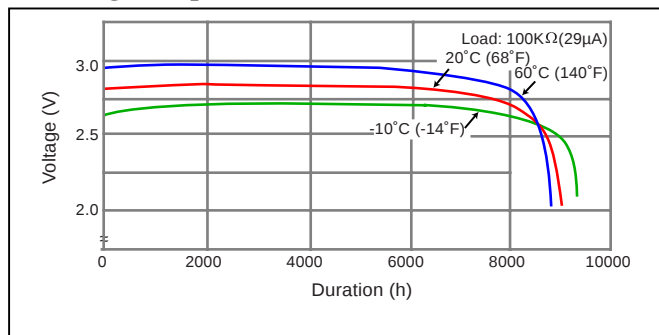


Capacity vs. load resistance

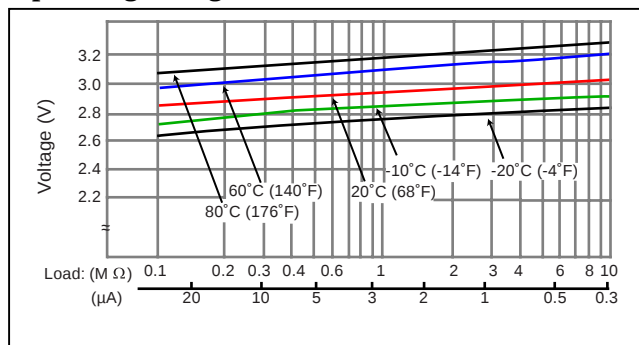


BR2330

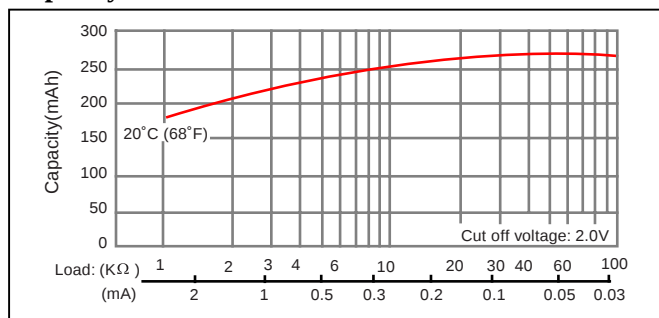
Discharge temperature characteristics



Operating voltage vs. load resistance

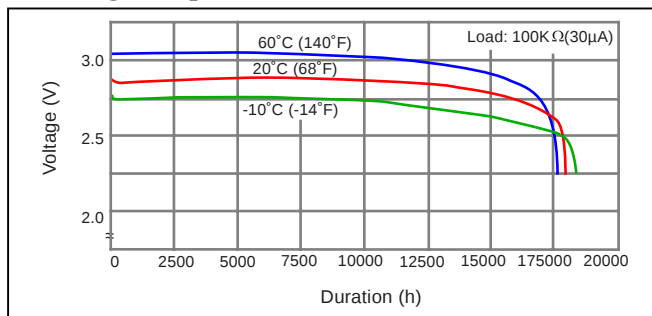


Capacity vs. load resistance

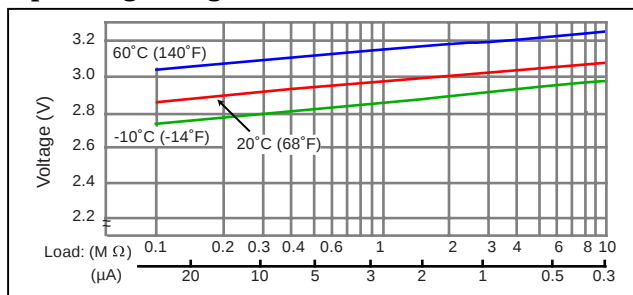


BR3032

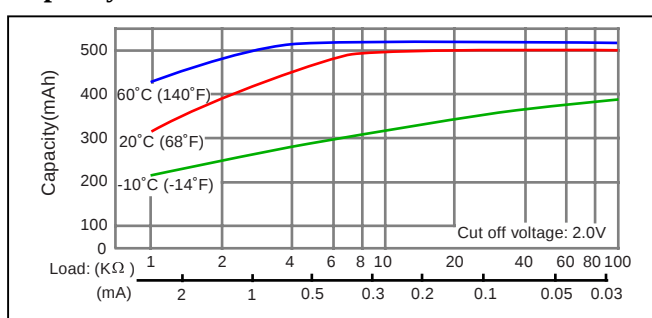
Discharge temperature characteristics



Operating voltage vs. load resistance

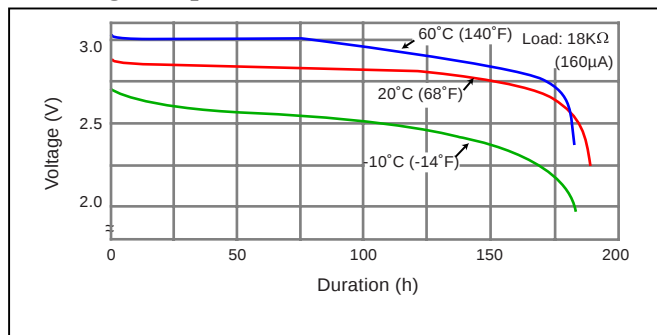


Capacity vs. load resistance

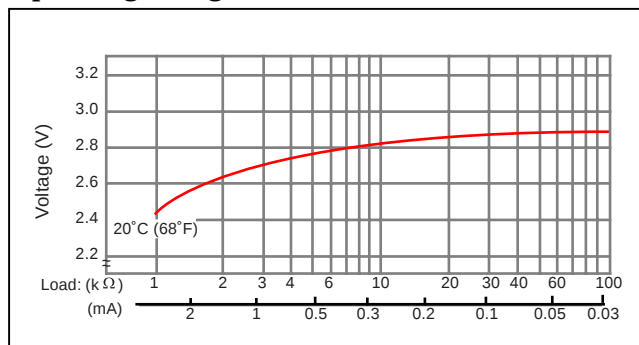


CR1025

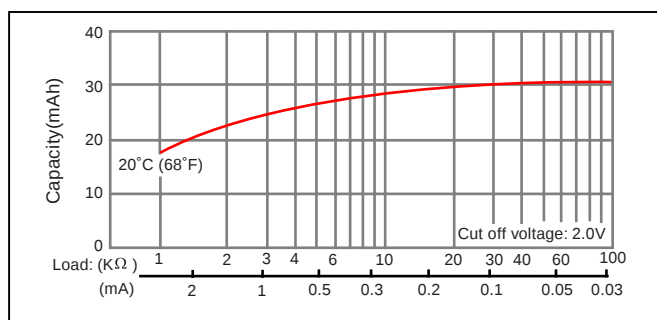
Discharge temperature characteristics



Operating voltage vs. load resistance

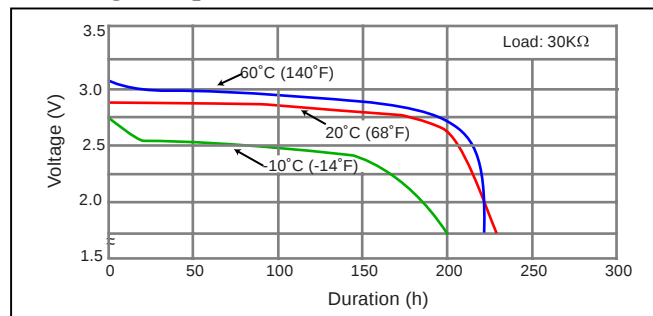


Capacity vs. load resistance

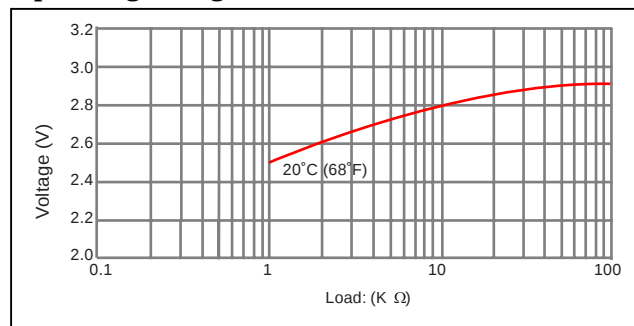


CR1212

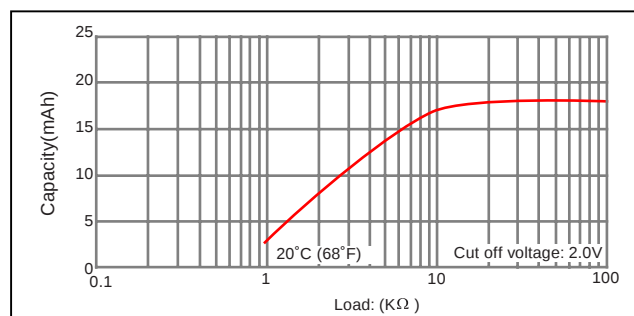
Discharge temperature characteristics



Operating voltage vs. load resistance

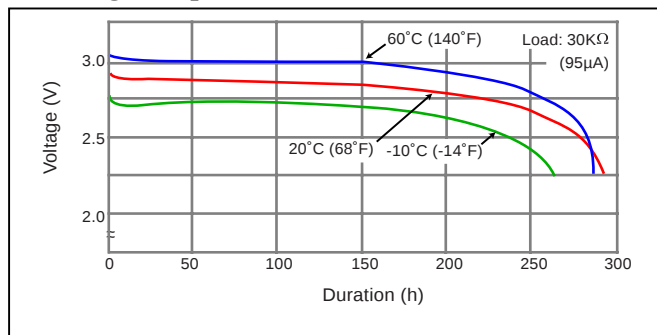


Capacity vs. load

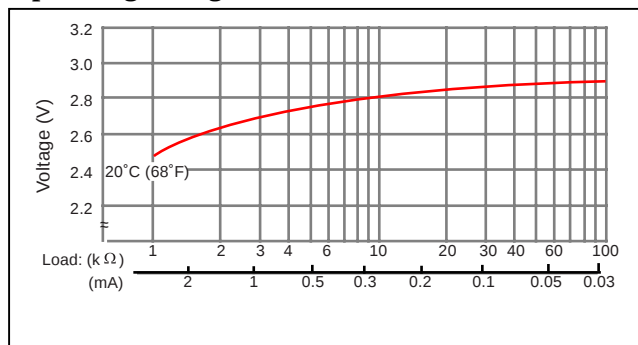


CR1216

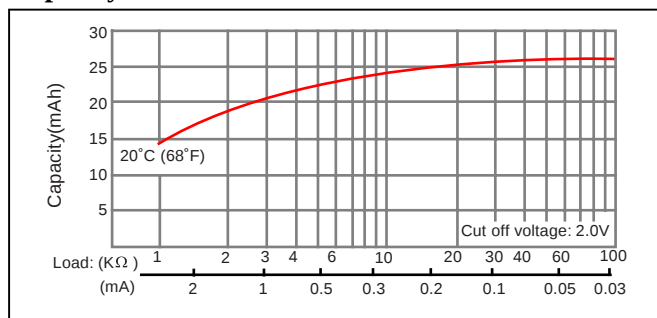
Discharge temperature characteristics



Operating voltage vs. load resistance

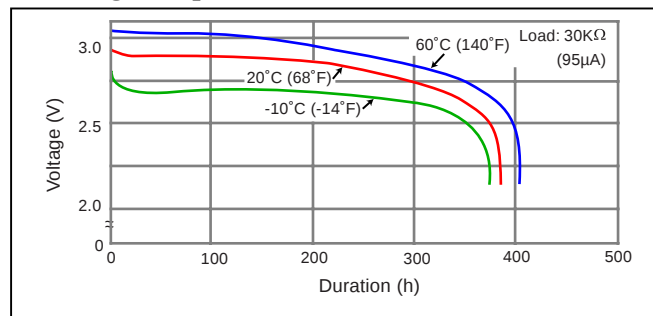


Capacity vs. load resistance

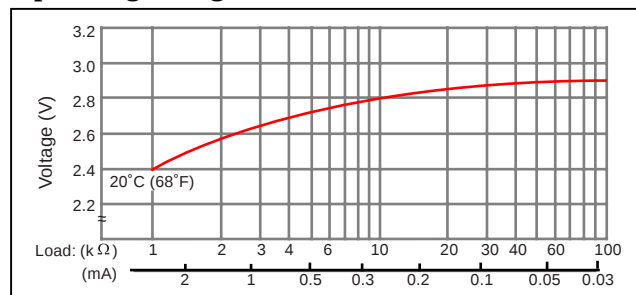


CR1220

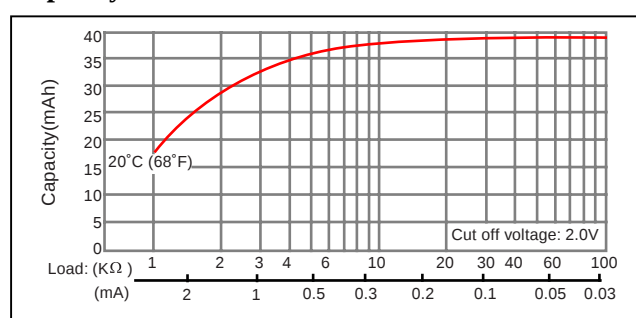
Discharge temperature characteristics



Operating voltage vs. load resistance

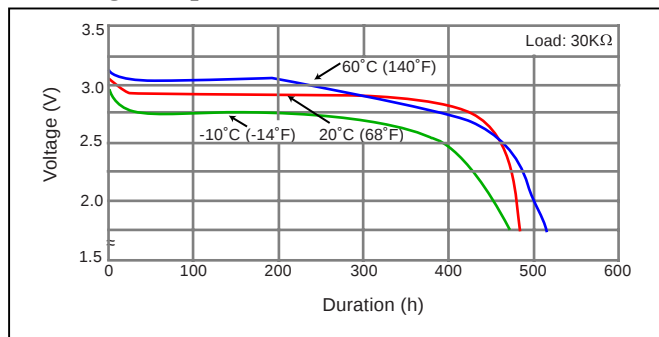


Capacity vs. load resistance

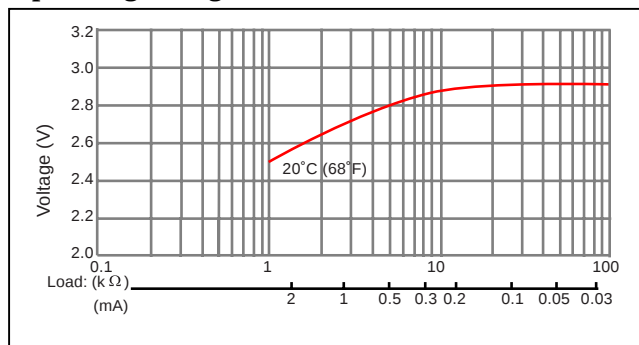


CR1612

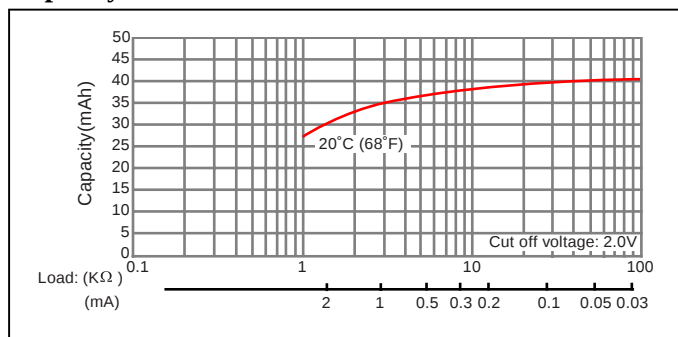
Discharge temperature characteristics



Operating voltage vs. load resistance

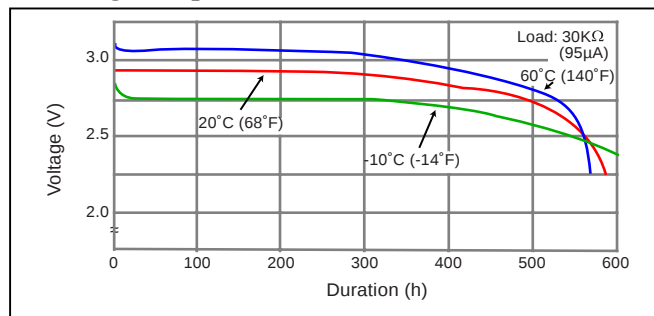


Capacity vs. load resistance

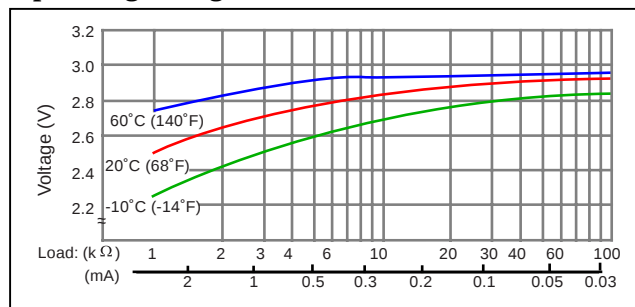


CR1616

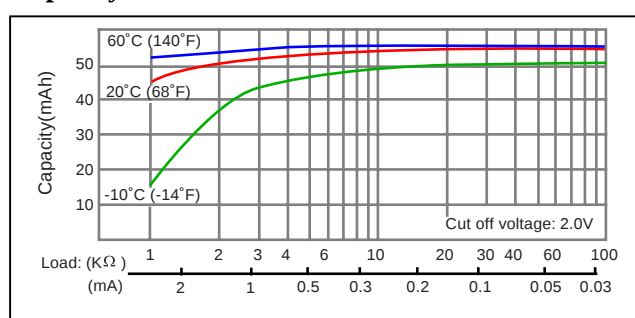
Discharge temperature characteristics



Operating voltage vs. load resistance

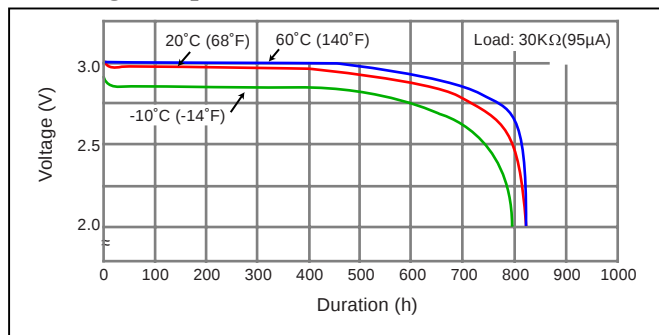


Capacity vs. load resistance

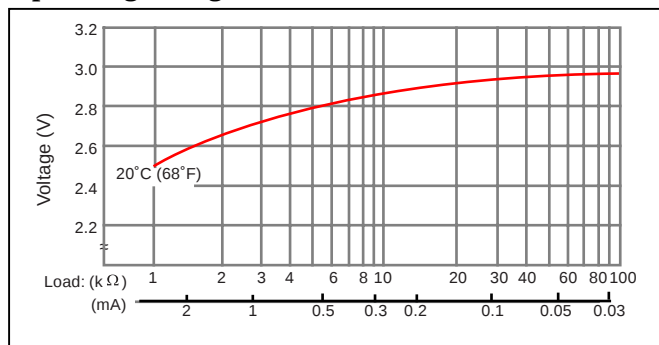


CR1620

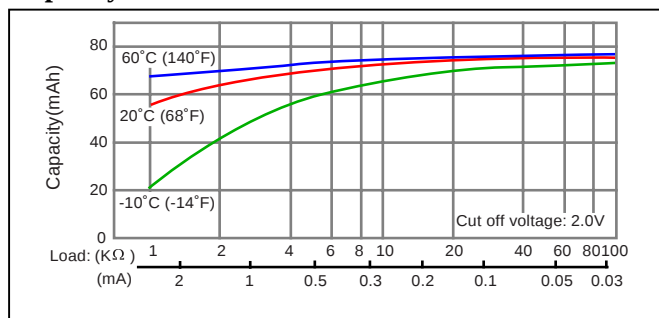
Discharge temperature characteristics



Operating voltage vs. load resistance

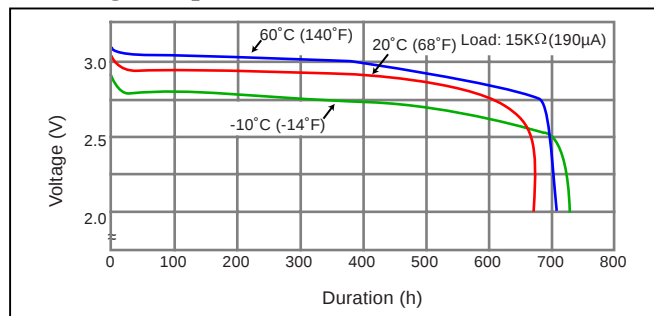


Capacity vs. load resistance

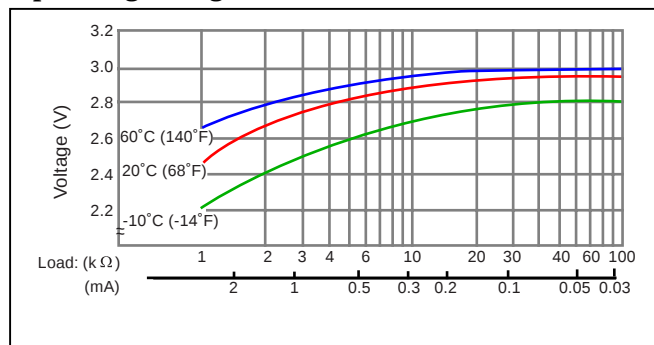


CR1632

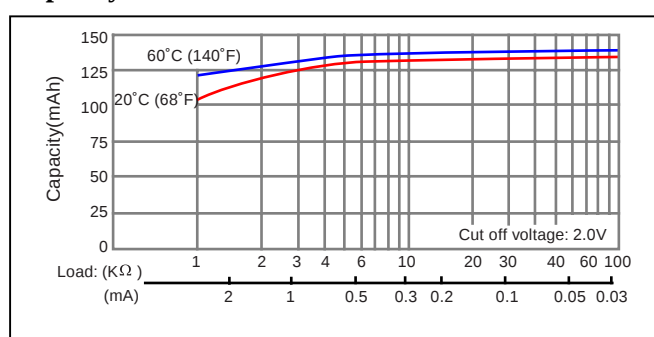
Discharge temperature characteristics



Operating voltage vs. load resistance

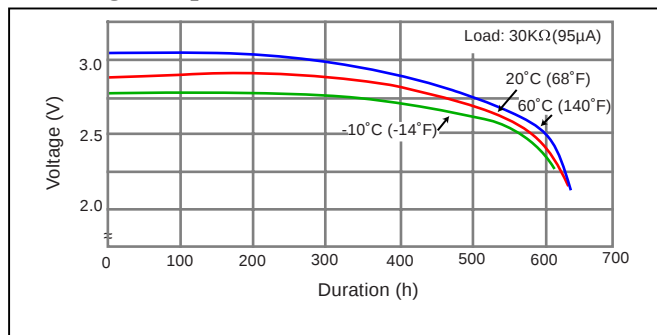


Capacity vs. load resistance

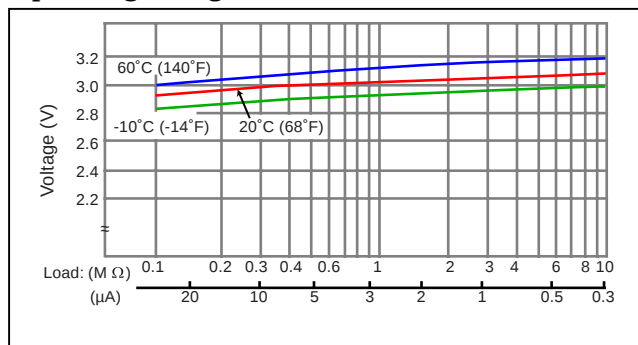


CR2012

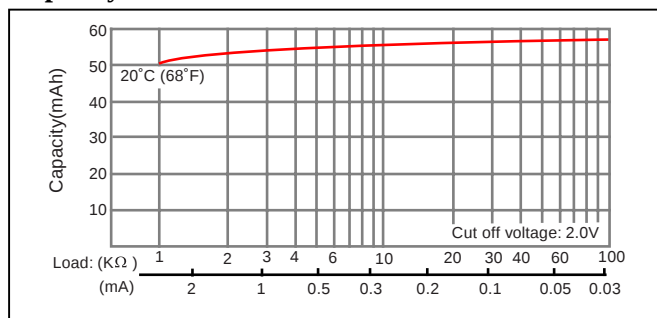
Discharge temperature characteristics



Operating voltage vs. load resistance

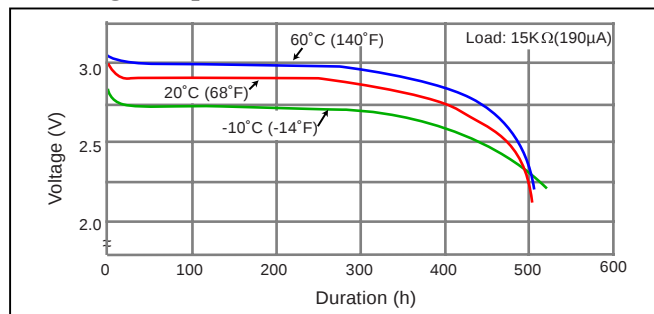


Capacity vs. load resistance

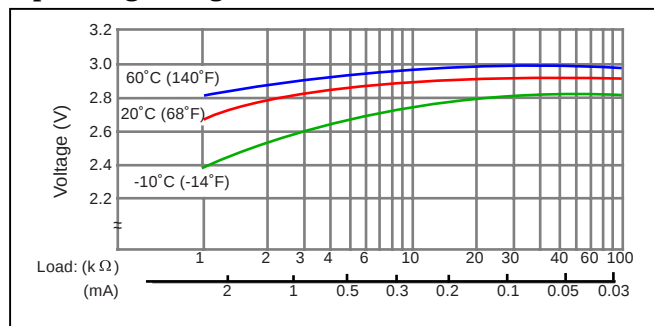


CR2016

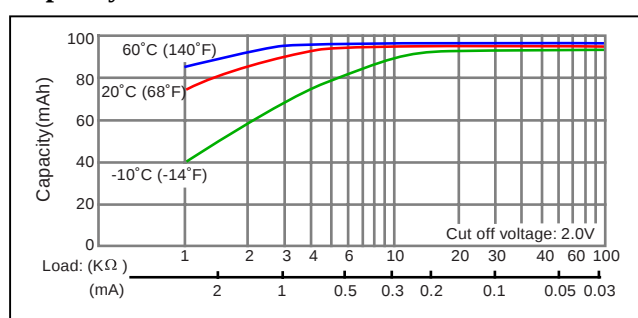
Discharge temperature characteristics



Operating voltage vs. load resistance

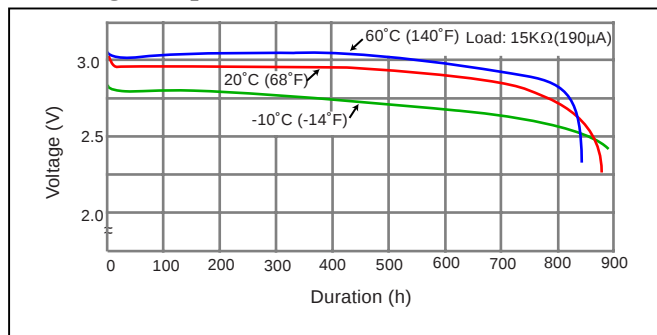


Capacity vs. load resistance

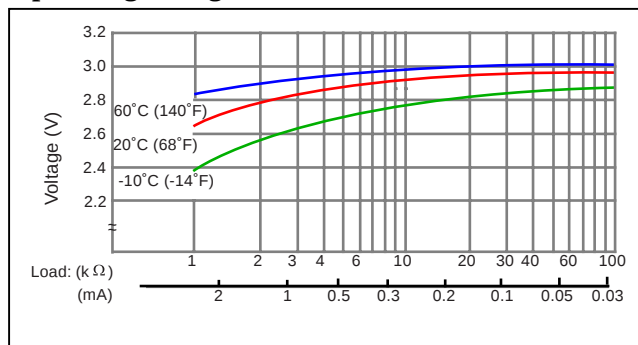


CR2025

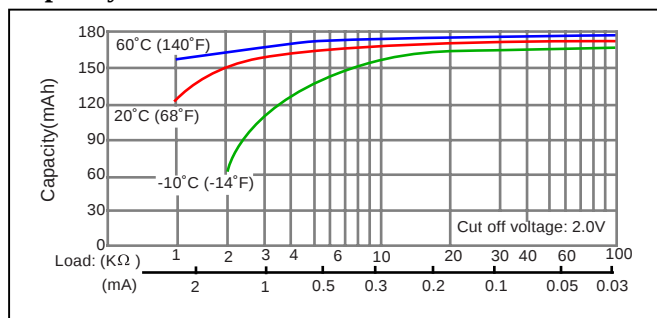
Discharge temperature characteristics



Operating voltage vs. load resistance

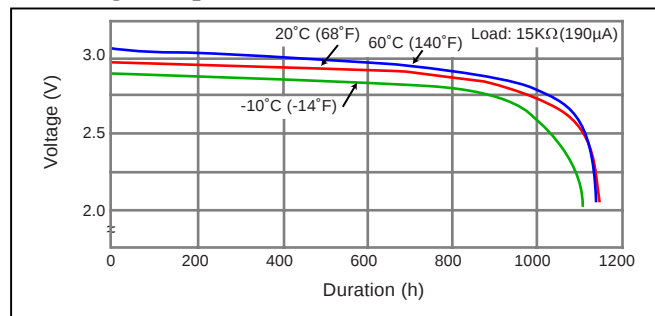


Capacity vs. load resistance

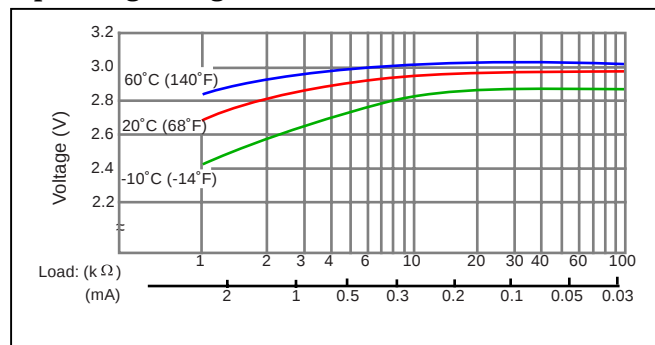


CR2032

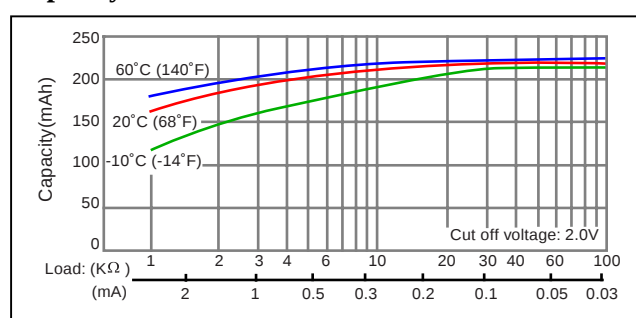
Discharge temperature characteristics



Operating voltage vs. load resistance

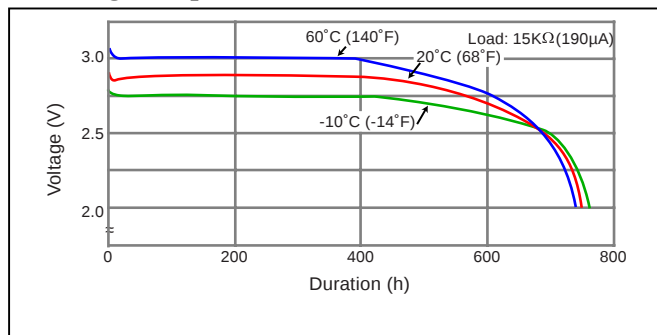


Capacity vs. load resistance

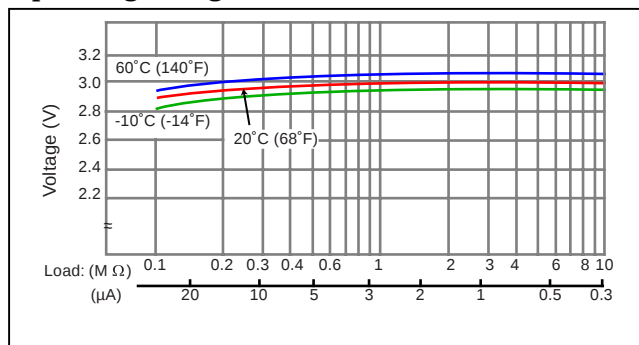


CR2320

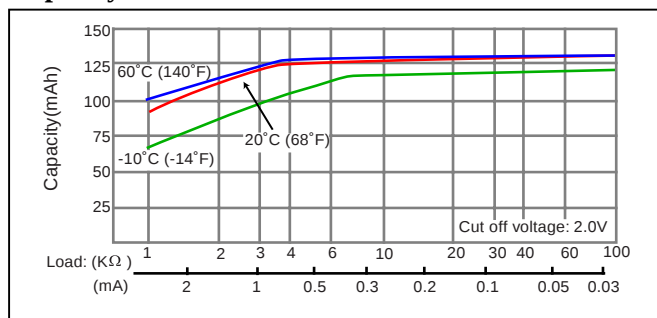
Discharge temperature characteristics



Operating voltage vs. load resistance

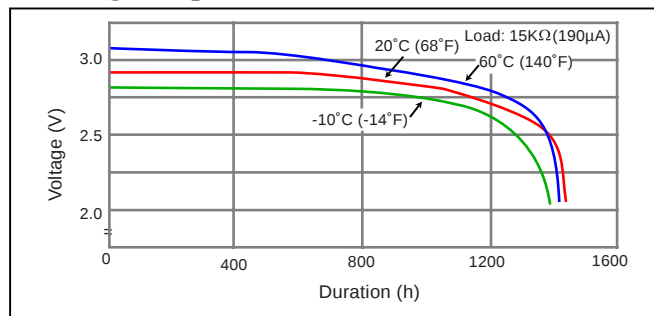


Capacity vs. load resistance

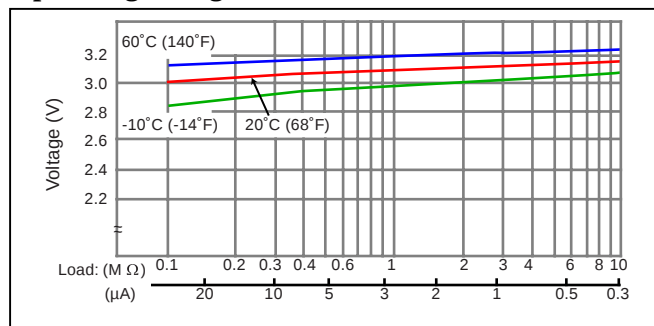


CR2330

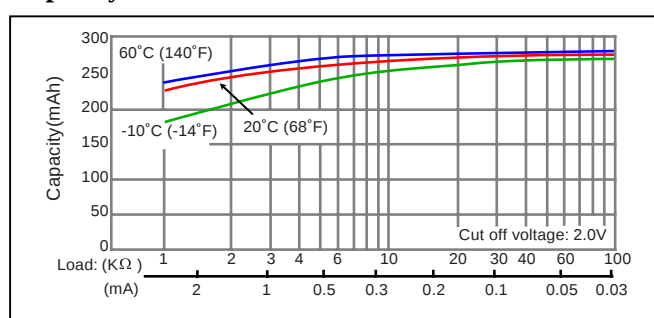
Discharge temperature characteristics



Operating voltage vs. load resistance

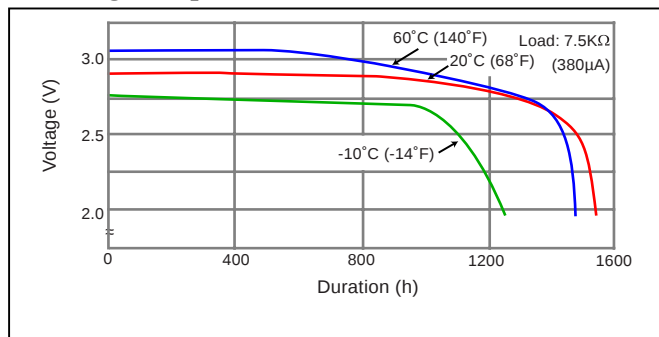


Capacity vs. load resistance

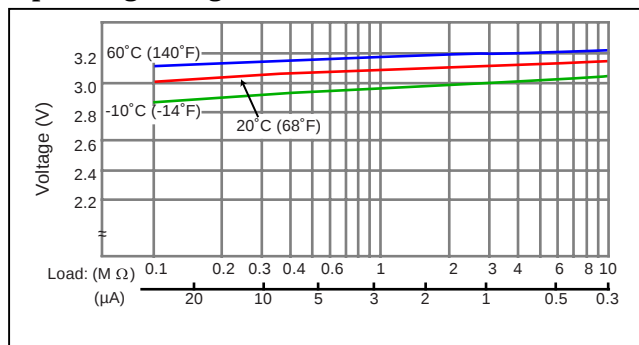


CR2354

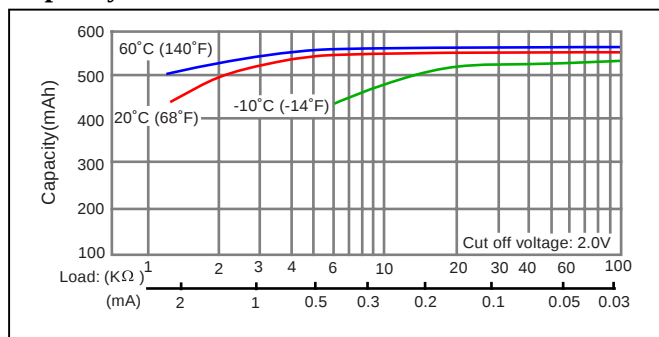
Discharge temperature characteristics



Operating voltage vs. load resistance

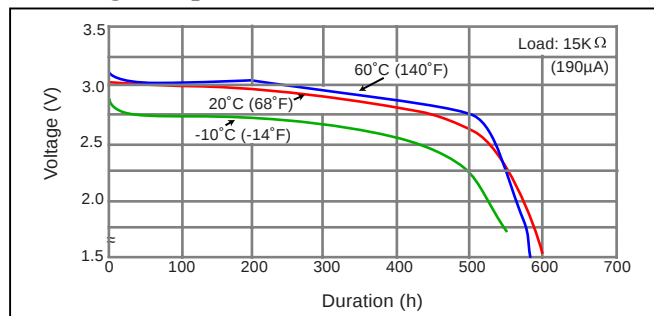


Capacity vs. load resistance

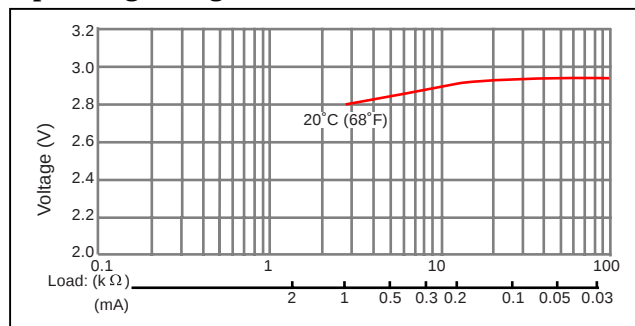


CR2412

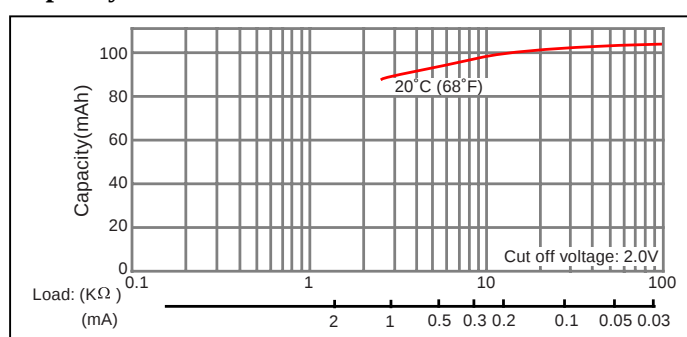
Discharge temperature characteristics



Operating voltage vs. load resistance

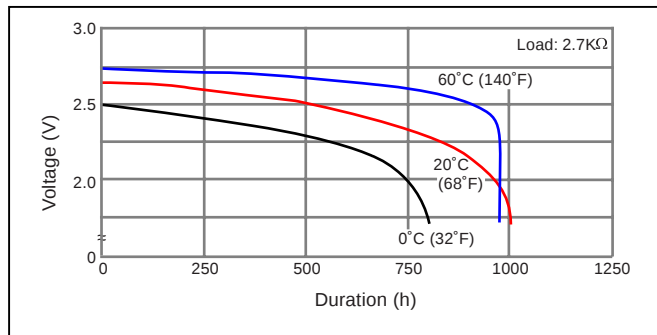


Capacity vs. load resistance



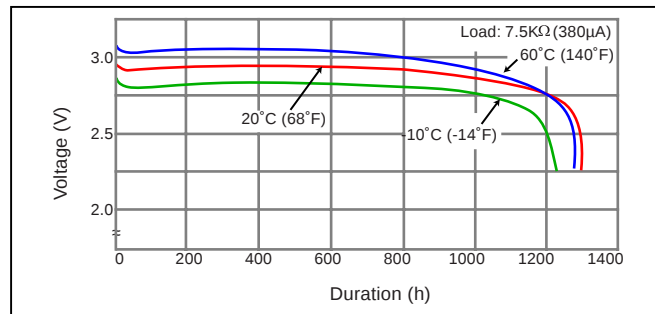
CR2477

Discharge temperature characteristics

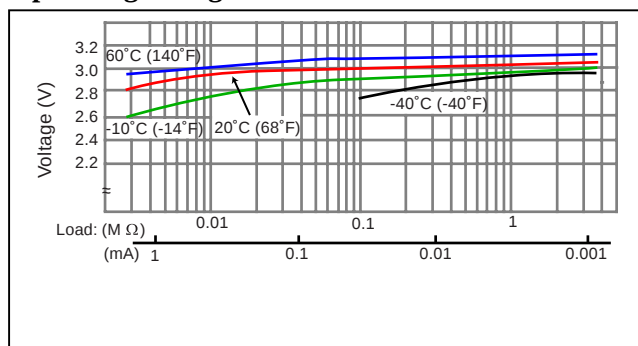


CR3032

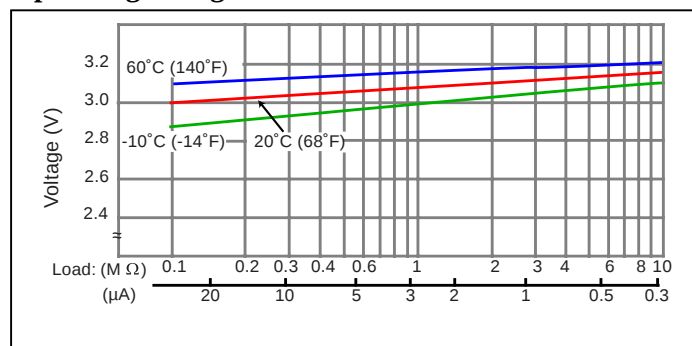
Discharge temperature characteristics



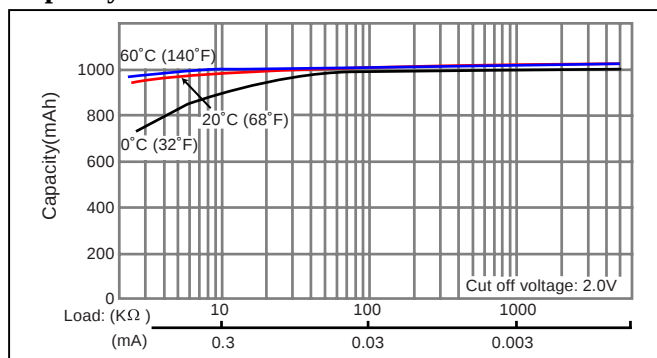
Operating voltage vs. load resistance



Operating voltage vs. load resistance



Capacity vs. load resistance



Capacity vs. load resistance

