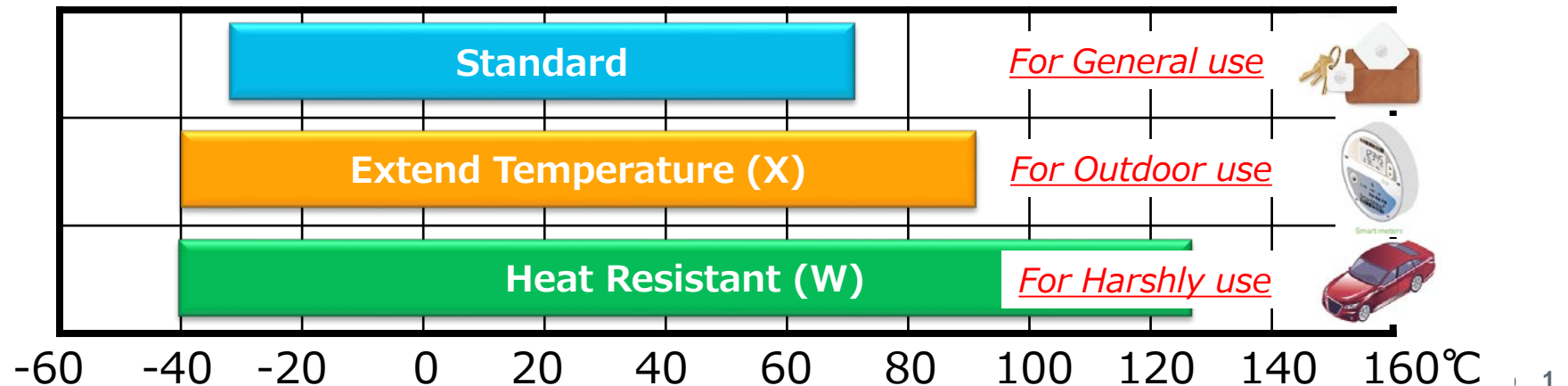# Micro Batteries for BLE Modules

Coin Manganese Dioxide Lithium Batteries

- High voltage (Normal 3.0V), high energy density
- Wide range of line up
- Outstanding Temperature characteristics
- IATF16949 Certification (former TS16949)

Series	Standard	Extended Temperature (X)	Heat Resistant (W)
Maximum pulse current*	30mA	30mA	30mA
Operating temperature	-30℃ to +70℃	-40℃ to +85℃	-40℃ to +125℃
Cost	Low	Middle	High

* Current for maintaining minimum 2V voltage with pulsed discharge of 3 seconds and 50% nominal capacity discharged (ambient temperature 23°C)
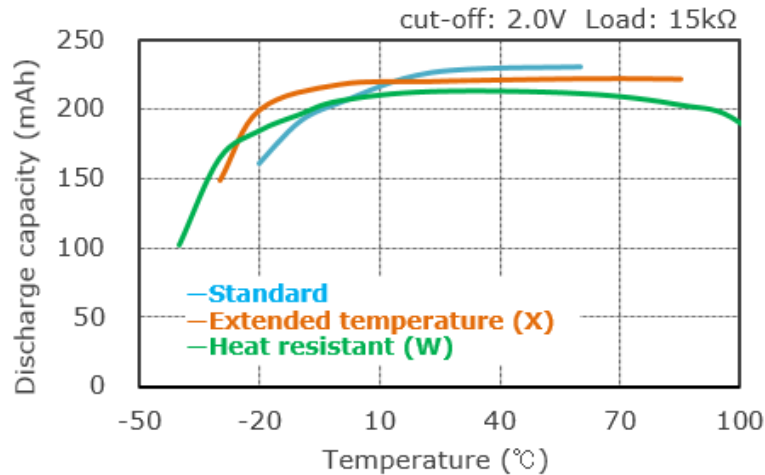

Standard — *For General use*

Extend Temperature (X) — *For Outdoor use*

Heat Resistant (W) — *For Harshly use*

-60   -40   -20   0   20   40   60   80   100   120   140   160℃

Characteristics of Different Series

Ex. CR2032

Discharge characteristics by temperature

cut-off: 2.0V Load: 15kΩ

- Standard
- Extended temperature (X)
- Heat resistant (W)

Discharge capacity (mAh) vs Temperature (℃)

Closed circuit voltage characteristics

- Standard
- Extended temperature (X)
- Heat resistant (W)

Test condition:10mA10msec@-20℃

Voltage (V) vs Discharge Capacity (mAh)

The capacity loss rate after storage at each temperature

- Standard
- Extended temperature (X)
- Heat resistant (W)

Capacity loss rate (%/year) vs Storage temperature (℃)

You can select Appropriate series Based on usage Temp.

More detailed data are available here!

Click ▶ CR2032 ⋯ Standard

Click ▶ CR2032X ⋯ Extended temperature

Click ▶ CR2032W ⋯ Heat resistant

BLE Simulation Result of Different Series

Ex. CR2032

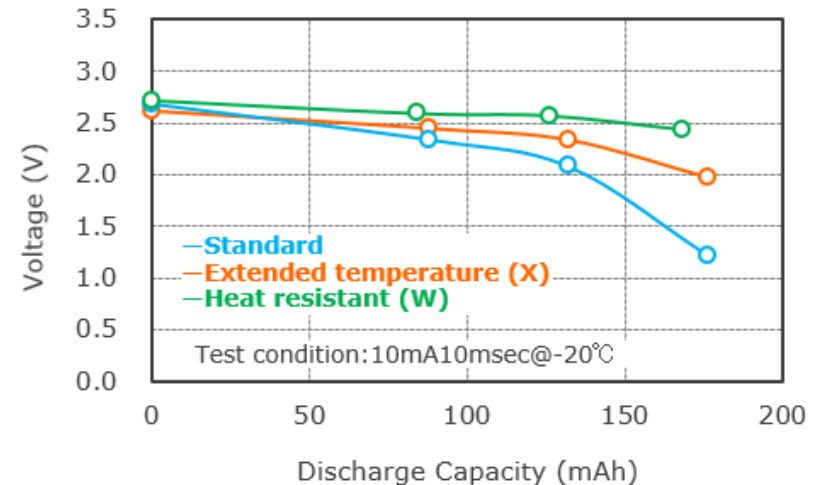*Data is not guaranteed, and is provided for reference purposes only.
Calculated by data transmission energy consumption ONLY

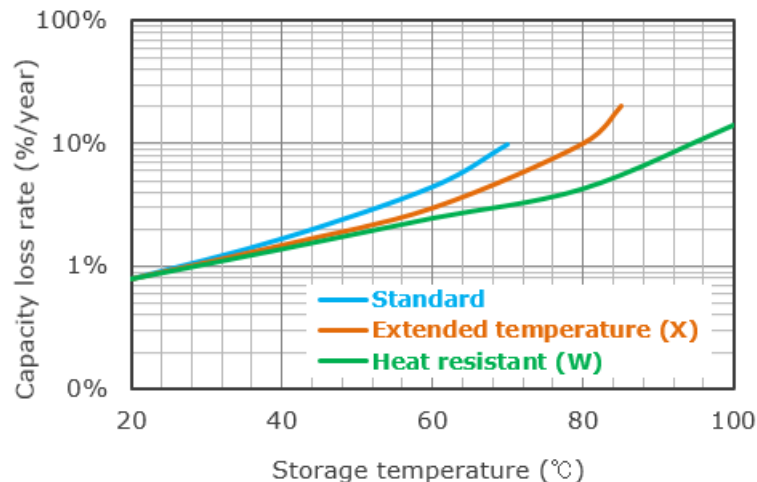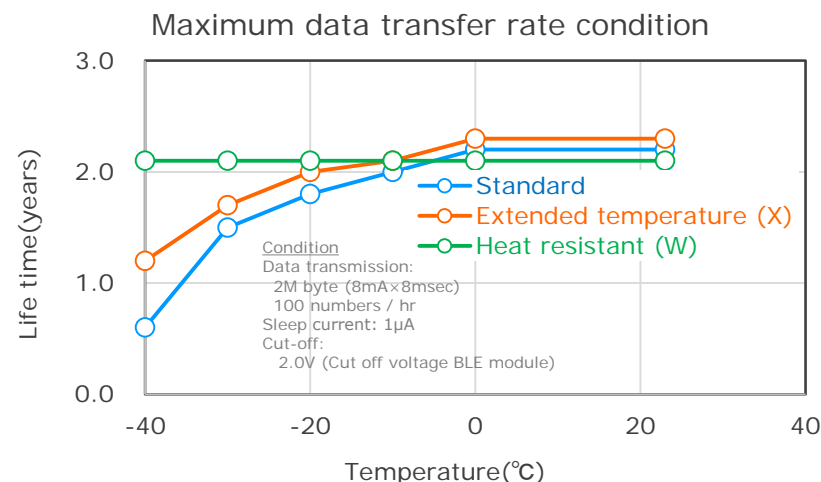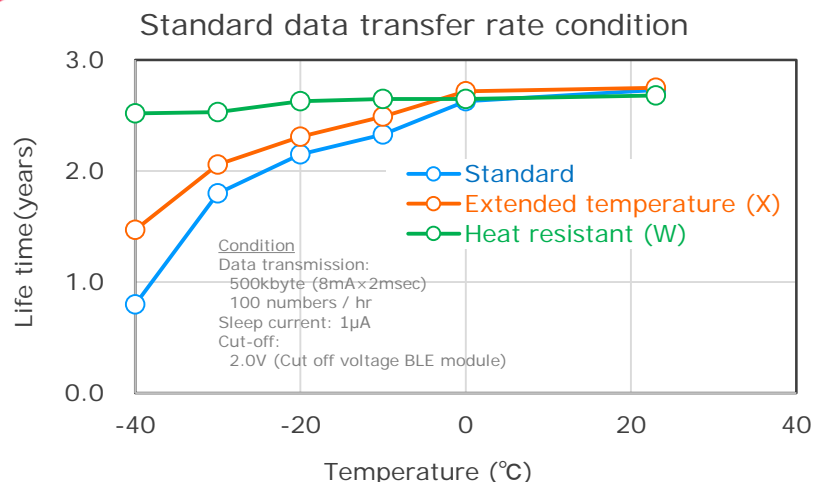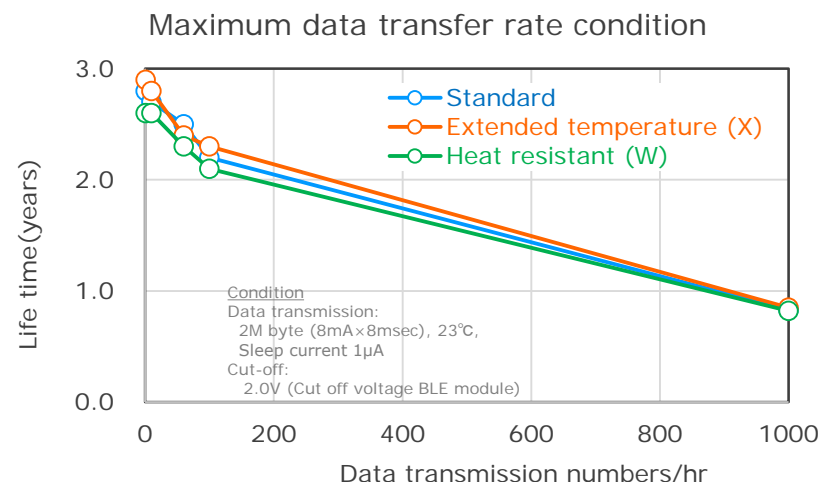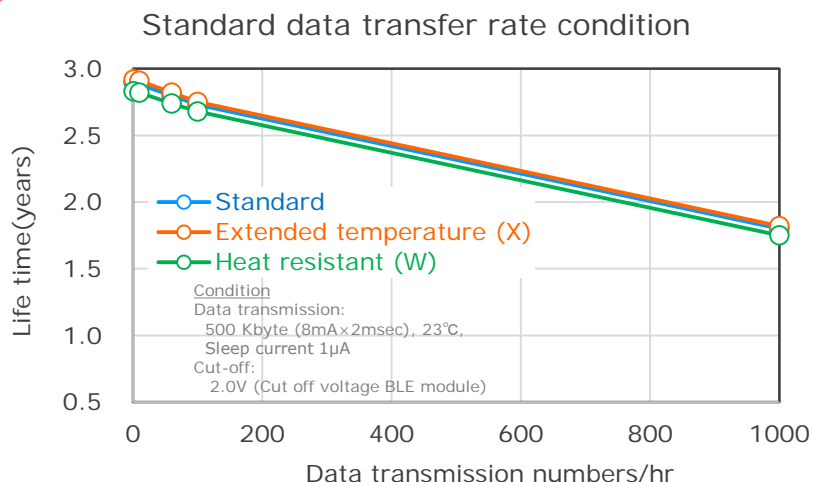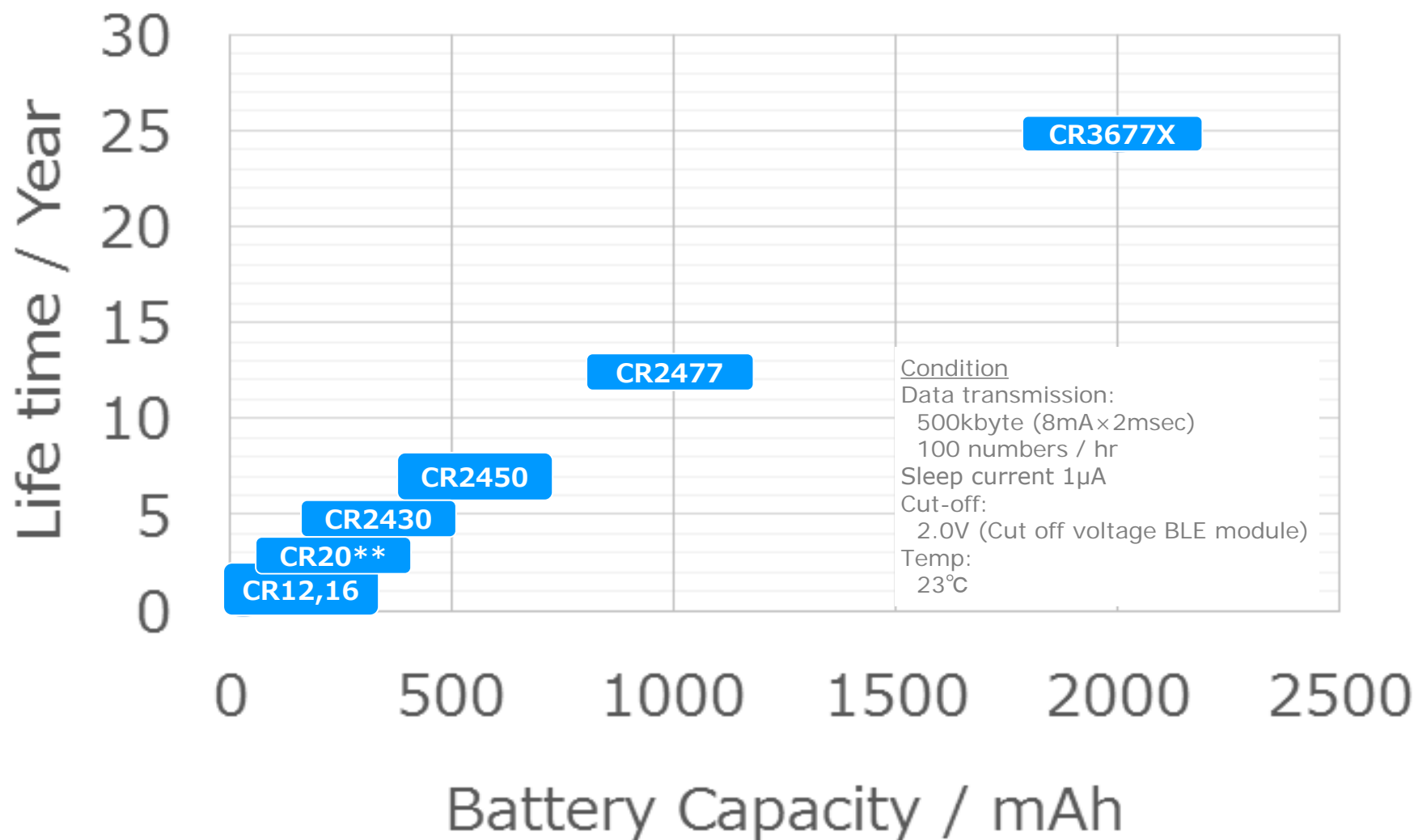### ◆ Lifetime simulation at different temperature

Standard data transfer rate condition

Life time(years) vs Temperature (℃)

Legend:
- Standard
- Extended temperature (X)
- Heat resistant (W)

Condition
Data transmission:
  500kbyte (8mA×2msec)
  100 numbers / hr
Sleep current: 1μA
Cut-off:
  2.0V (Cut off voltage BLE module)

Maximum data transfer rate condition

Life time(years) vs Temperature(℃)

Legend:
- Standard
- Extended temperature (X)
- Heat resistant (W)

Condition
Data transmission:
  2M byte (8mA×8msec)
  100 numbers / hr
Sleep current: 1μA
Cut-off:
  2.0V (Cut off voltage BLE module)

◆ Lifetime simulation at different data transfer numbers/hr

Standard data transfer rate condition

Life time(years) vs Data transmission numbers/hr

Legend:
- Standard
- Extended temperature (X)
- Heat resistant (W)

Condition
Data transmission:
  500 Kbyte (8mA×2msec), 23℃,
  Sleep current 1μA
Cut-off:
  2.0V (Cut off voltage BLE module)

Maximum data transfer rate condition

Life time(years) vs Data transmission numbers/hr

Legend:
- Standard
- Extended temperature (X)
- Heat resistant (W)

Condition
Data transmission:
  2M byte (8mA×8msec), 23℃,
  Sleep current 1μA
Cut-off:
  2.0V (Cut off voltage BLE module)

Life Time Simulation Result by Model

CR3677X

CR2477

CR2450

CR2430

CR20**

CR12,16

Condition
Data transmission:
 500kbyte (8mA×2msec)
 100 numbers / hr
Sleep current 1μA
Cut-off:
 2.0V (Cut off voltage BLE module)
Temp:
 23℃

Life time / Year (Y-axis: 0, 5, 10, 15, 20, 25, 30)

Battery Capacity / mAh (X-axis: 0, 500, 1000, 1500, 2000, 2500)

23 October 2020   4

Data Sheet Available Here

Please click model name

Diameter \ Height	1.6 mm	2.0 mm	2.5 mm	3.0 mm	3.2 mm	5.0 mm	7.7 mm
12 mm	CR1216 30 mAh	CR1220 40 mAh					
16 mm	CR1616 60 mAh	CR1620 80 mAh			CR1632 140 mAh		
20 mm	CR2016 90 mAh		CR2025 160 mAh		CR2032 220 mAh		
20 mm					CR2032X 220 mAh		
20 mm					CR2032W 210 mAh	CR2050W 345 mAh	
24 mm				CR2430 300 mAh		CR2450 610 mAh	CR2477 1000 mAh
24 mm						CR2450X 600 mAh	CR2477X 1000 mAh
24 mm						CR2450W 550 mAh	CR2477W 1000 mAh
36 mm							CR3677X 2000 mAh

■ Standard
■ Extended Temperature (X)
■ Heat Resistant (W)

Move Right or Down, Size will be bigger, Life will be longer

23 October 2020 **5**
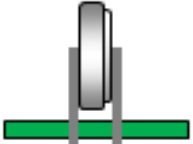
Sample Available Here

Please click model name

Diameter \ Height	1.6 mm	2.0 mm	2.5 mm	3.0 mm	3.2 mm	5.0 mm	7.7 mm
12 mm	CR1216 30 mAh	CR1220 40 mAh					
16 mm	CR1616 60 mAh	CR1620 80 mAh			CR1632 140 mAh		
20 mm	CR2016 90 mAh		CR2025 160 mAh		CR2032 220 mAh		
20 mm					CR2032X 220 mAh		
20 mm					CR2032W 210 mAh	CR2050W 345 mAh	
24 mm				CR2430 300 mAh		CR2450 610 mAh	CR2477 1000 mAh
24 mm						CR2450X 600 mAh	CR2477X 1000 mAh
24 mm						CR2450W 550 mAh	CR2477W 1000 mAh
36 mm							CR3677X 2000 mAh

Legend:
- ■ Standard
- ■ Extended Temperature (X)
- ■ Heat Resistant (W)

Move Right or Down, Size will be bigger, Life will be longer

23 October 2020   6

Sample with TAB Available Here

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Please click model name		H			V	M
Mounting Direction						
	Shape	E	E	O	E	P
Tab Spec	Width of Negative Tab Tip (mm)	0.75	0.75	1.8	0.75	2
	Width of Positive Tab Tip (mm)	0.75×2	0.75×2	2.8	0.75×2	2
	Pitch (mm)	17.8	20.5	20.5	N/A	N/A
Standard	CR2032	CR2032-HE8	CR2032-HE1	CR2032-HO6	CR2032-VE3	
	CR2430	CR2430-HE1	CR2430-HE2	CR2430-HO1	CR2430-VE1	
	CR2450	CR2450-HE5	CR2450-HE6	CR2450-HO5	CR2450-VE6	
Extended Temperature (X)	CR2032X		CR2032X-HE1	CR2032X-HO6		
	CR2450X		CR2450X-HE6	CR2450X-HO5		
	CR2477X		CR2477X-HE2	CR2477X-HO4		
Heat Resistant (W)	CR2032W		CR2032W-HE1	CR2032W-HO6		
	CR2050W					CR2050W-MP6
	CR2450W		CR2450W-HE6	CR2450W-HO5		CR2450W-MP1
	CR2477W		CR2477W-HE2	CR2477W-HO4		

Vertical line models have Same soldering position

**Vertical line models have same tab soldering position,
You can easily switch to another model in same vertical lane**

Murata Micro Battery Web Site

https://www.murata.com/products/batteries/micro

IF you have any questions and Inquiry,

Please Click ▶ Contact Form