

Advantages of using Murata micro batteries (SR, LR) in portable medical devices

1. Overview

In recent years, the demand for portable medical devices that can monitor vital data such as human body sweat, temperature, heart rate, blood pressure and blood glucose level, etc. has increased. The basic health data of the human body has been difficult to quantify so far. However, portable medical devices can visualize the user's health status by communicating the data or storing data in memory and analyzing data. These devices can provide user useful information for their health maintenance and health issues.

The insulin pumps periodically inject insulin by a motor drive to diabetic patients who lack insulin and used for the purpose of effectively controlling the blood glucose level. These devices are required to be miniaturized because they are attached to the human body. In order to meet the portable medical devices market needs, we believe Murata micro batteries (SR: Silver oxide batteries, and LR: Alkaline manganese batteries) will be one of the dominant tools.

2. Advantages

Below are the advantages of Murata's micro batteries; 1. SR: Silver oxide batteries, 2. LR: Alkaline manganese batteries.

Lineup of smaller size and wide range of sizes.

The table below shows the SR button type silver oxide battery and the LR button type alkaline battery (Capacity vs Size).

Thickness	Type	0.308 inch (0.0077 inch)	0.055 inch	0.063 inch	0.079 inch (0.0093 inch)	0.102 inch (0.106 inch)	0.118 inch (0.122 inch)	0.142 inch	0.165 inch	0.213 inch
0.189inch	NaOH			SR4165W (8.3)	SR4215W (12.5)					
0.228inch	NaOH	SR5125 W(4)		SR5165W (11.5)	SR5215W (14)	SR5275W (22.5)				
0.258inch	NaOH			SR6165W (14)	SR6215W (18)	SR6265W (28)				
	KOH			SR631W (20)	SR636W (28)					
0.311inch	NaOH	SR7125W (9.5)	SR7145W (15)	SR7165W (23)	SR7215W (25)	SR7265W (35)	SR7315W (39)			
	KOH				SR731W (29)	SR736W (35)		SR41 (45)	LR41 (45)	SR48 (75)
0.374inch	NaOH			SR9165W (30)	SR9205W (35)	SR9275W (52)	SR9365W (70)			
	KOH				SR920W (40)	SR927W (52)	SR936W (70)			
0.457inch	NaOH									
	KOH			SR1116 (30)	SR1120 (40)	SR1130 (65)	SR1130 (70)	LR43 (110)	LR44 (120)	

The number in () shows nominal capacity (mAh)

Murata offers a wide lineup of small size batteries, which will contribute to the miniaturization of wearable devices.

High output (current)

Next, the upper right graph shows the relationship between capacity (mAh) and output current (mA) of SR/LR and CR.

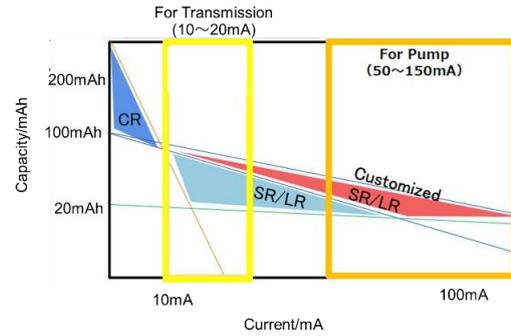
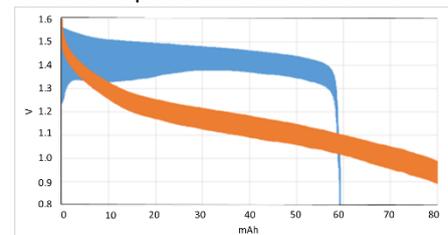


Fig.1 Capacity (mAh) vs Output (mA)

SR/LR uses an aqueous solution as the electrolyte solution and has a low internal resistance, enabling heavy load pulse discharge such as LED lighting, communication (BLE), and driving of small motors. (However, it can be used in 2 or 3 series). On the other hand, CR has higher voltage and capacity than SR/CR. However conventional CR cannot output high current because of large internal resistance.

Graph below shows pulse test result of SR vs LR



Test conditions: LR (Orange), SR (Blue)

- Cycle discharge at 23°C, Pulse discharge : 30mA×0.1sec, Interval : 0.1sec

A single SR or LR can drive a small motor of about 0.1W. The SR/LR is a battery suitable for portable medical devices because it can maintain high output while keeping the devices small size.

3. Recommended application

Below are the advantages Portable medical devices: insulin pump (pen type), CGM, capsule endoscopy



4. Technical support

➤ Samples can be purchased from the link below.

[Click ▶ Stock check](#)

➤ Our web page shows more details.

<https://www.murata.com/en-global/products/batteries/micro>

➤ If you have any questions, please feel free to contact.

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