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

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

The insulin pumps periodically inject insulin by motor drive to diabetic patients who lack insulin and used for the purpose of effectively controlling the blood glucose level. As these type of devices are worn by human body, downsizing are necessary. In order to meet this portable medical devices market needs, we believe our Murata micro batteries (SR: Silver oxide batteries, and LR: Alkaline manganese batteries) will be one of dominant tools.

2. Advantage
Below, advantages of our Murata micro batteries; 1. SR: Silver oxide batteries. 2. LR: Alkaline manganese batteries.

Lineup of smaller size and wide range of sizes.
The graph below shows the capacity vs size of size of the primary batteries (shops and Web sites).

![Graph showing capacity vs size of Murata micro batteries](image)

The number in ( ) shows nominal capacity (mAh) Murata offers a wide lineup of small size batteries, which will can 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.

![Graph showing capacity vs output current](image)

Fig.1 Capacity (mA/h) vs Output (mA)
By using an aqueous solution as the electrolyte, SR/LR achieve lower internal resistance and enable pulse high discharge for communication (BLE) and small motor driving (However, 2 or 3 series use is required). On the other hand, CR has higher voltage and capacity than SR/CR. However conventional CR cannot output high current.

Below shows pulse test result of SR vs LR

<table>
<thead>
<tr>
<th>B</th>
<th>0.373inch NaOH</th>
<th>0.457inch NaOH</th>
<th>0.374inch KOH</th>
<th>0.457inch KOH</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.818inch SR</td>
<td>0.079 inch</td>
<td>0.083 inch</td>
<td>0.091 inch</td>
<td>0.102 inch</td>
</tr>
<tr>
<td>2.288inch SR</td>
<td>0.118 inch</td>
<td>0.122 inch</td>
<td>0.130 inch</td>
<td>0.142 inch</td>
</tr>
<tr>
<td>2.883inch SR</td>
<td>0.157 inch</td>
<td>0.165 inch</td>
<td>0.173 inch</td>
<td>0.189 inch</td>
</tr>
<tr>
<td>3.131inch SR</td>
<td>0.184 inch</td>
<td>0.192 inch</td>
<td>0.200 inch</td>
<td>0.213 inch</td>
</tr>
<tr>
<td>3.746inch SR</td>
<td>0.228 inch</td>
<td>0.236 inch</td>
<td>0.244 inch</td>
<td>0.258 inch</td>
</tr>
<tr>
<td>4.877inch SR</td>
<td>0.285 inch</td>
<td>0.293 inch</td>
<td>0.301 inch</td>
<td>0.311 inch</td>
</tr>
<tr>
<td>8.801inch SR</td>
<td>0.615 inch</td>
<td>0.623 inch</td>
<td>0.631 inch</td>
<td>0.645 inch</td>
</tr>
</tbody>
</table>

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.

Recommended application
Portable medical devices: Insulin pump (pen type), CGM, Capsule endoscope

4. Technical support
Sample and Technical support
Please contact our local office or authorized agent