

Introduction of operation stability for IoT devices (outdoor application) at high ambient temperature

1. Overview

IoT devices outdoor used such as Smart meters and TPMS are required to be maintenance free and highly reliable. Primary batteries (such as alkaline batteries or coin-shaped/cylinder-shaped lithium ion batteries) that are easy to get, are used in many IoT devices. However the battery life is greatly affected by power consumption and load peak current which depend on the ambient temperature, the load sensors, the amount of data communication distance and frequency. In order to ensure sufficient battery life respond to maintenance free, It is necessary to reduce the influence by voltage fluctuation during communication requires high voltage and consider the internal resistance of battery at low ambient temperature. The Maximum temperature limit of commonly used alkaline manganese batteries is 45°C and that of alkaline button batteries is 60°C. This means the self-discharge trends to increase as the temperature is raised. Murata “Extended temperature type” lithium coin batteries can solve this problem. This “Extended temperature type” can achieve wide operating range (-40°C to 85°C) with our innovative technology. The lower self-discharge at high temperatures (85 °C) ensures stable operating stability even when applied to IoT devices in high ambient temperature.

2. Effects

➤ Maximize battery run time

By reducing the self-discharge that affects battery life, the “Extended temperature type” can increase the usage rate of battery run time and support maintenance-free operation. In addition, this type battery can contribute to automotive applications and industrial equipment applications which are used at high ambient temperature.

Recommended applications

- Automotive applications (TPMS、 Drive counter)
- Industrial equipment application (RTC back up (Smart meter、 FA equipment))



Smart meter

The following Fig.2 is the high temperature storage data(for 1 year) of standard CR2032 and Extended temperature type CR2032X.

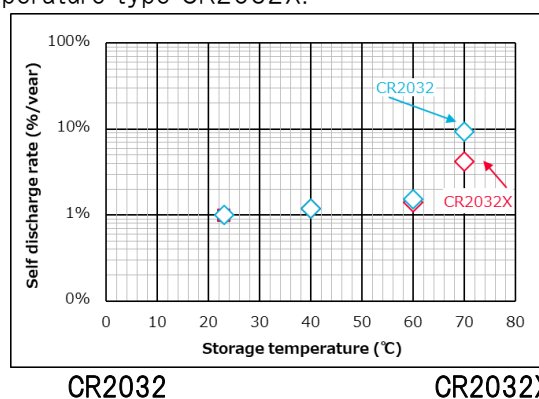


Fig.2 Self-discharge rate at each temperature CR2032 vs CR2032X

As the “Extended temperature type” has low self-discharge rate, it is possible to stably operate application even after high ambient temperature storage.

3. Series Lineup

Recommended products (Extended temperature type)

PN	Nominal capacity (mAh)	Diameter (inch)	height (inch)	Nominal Voltage (V)	Operating temperature * (°C)
CR2032X	220	0.787	0.126	3.0	-40~85
CR2450X	600	0.965	0.197	3.0	-40~85
CR2477X	1000	0.965	0.303	3.0	-40~85

4. Technical support

Sample

- Please contact our local sales office or authorized agent.

Technical support

- Our web page shows more details

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

If you have any questions, please feel free to contact our sales department or the nearest sales office.