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APPROVAL SHEET

CUSTOMER	
PRODUCT	**3.0V LITHIUM-MANGANESE BUTTON CELL**
MODEL	**CR2032**
PREPARED BY	
APPROVED BY	
VERSION	**REV01**
DATE	**October 26, 2009**

1. [SCOPE]

This specification applies to the following 3.0v lithium button cell CR2032.

2. [RATINGS]

TABLE 1:

ITEM		UNIT	SPECIFICATIONS	CONDITIONS
Nominal voltage		V	3.0	Standard discharge
Nominal capacity		mAh	210	Standard discharge
Instantaneous short-circuit current		mA	≥300	Time≤0.5second
Off-load voltage		V	3.25 – 3.60	Unit cell
Storage temperature		℃	0 - 40	Unit cell
Apply temperature		℃	-20 - 60	Unit cell
Standard weight		g	2.85	Unit cell
Service output	Initial	h	200	Continuous discharge with load 3 k Ω ,till 2.0v end-voltage at 20-25 ℃
	After 12 months storage	h	196	
Note： Aqueous electrolyte specification、Dimension standard of our products meet IEC 60086-1：2000（namely GB/T8897.1-2003，Primary Batteries - Part 1）				

TABLE 2:

ITEM	CONDITIONS	CHARACTERISTICS
Self-discharge rate	Stored for 12 months at normal temperature, then continuously discharged with 15 k Ω load till 2.0v end-voltage	Less than ≤2%

Table3

Project	Condition	Test temperature	Characteristics	
Off-load voltage	Off-load	23℃±3℃	3.05v-3.35v	
		0℃±3℃	3.05v-3.35v	
On-load voltage	15kΩ load after 0.8S	23℃±3℃	3.00v-3.35v	
		0℃±3℃	3.00v-3.35v	
service output	Continuously discharged under 15kΩ load till 2.0V end-voltage	23℃±3℃	Standard	1000h
			Min value	800h
		0℃±3℃	Standard	850h
			Min value	680h

Table 4

Project	Condition	Characteristics	
Thermal durability	Kept for 20 days at 60℃±3℃, then continuously discharged under 15kΩ load till 2.0V end-voltage	Standard	935h
		Min value	748h
Self-charging rate	Stored for 12 month at normal temperature, then continuously discharged under 15kΩ load till 2.0V end-voltage	Less than 5%	

3. [PERFORMANCE AND TEST METHODS]

Unless otherwise stated, all the testing is carried out under the condition: environmental temperature, 20℃-25℃; environmental humidity,65±20%.

4. [SUGGESTIONS AND CAUTIONS]

4.1 Install batteries correctly
4.2 Ensure the contact points to be clean and conductive
4.3 Do not mix different types, different brands batteries to serve together
4.4 Do not heat, recharge the batteries
4.5 Do not dispose of the batteries in fire
4.6 Keep away form the small children, if swallow promptly see doctor
4.7 Pay attention to the producing date

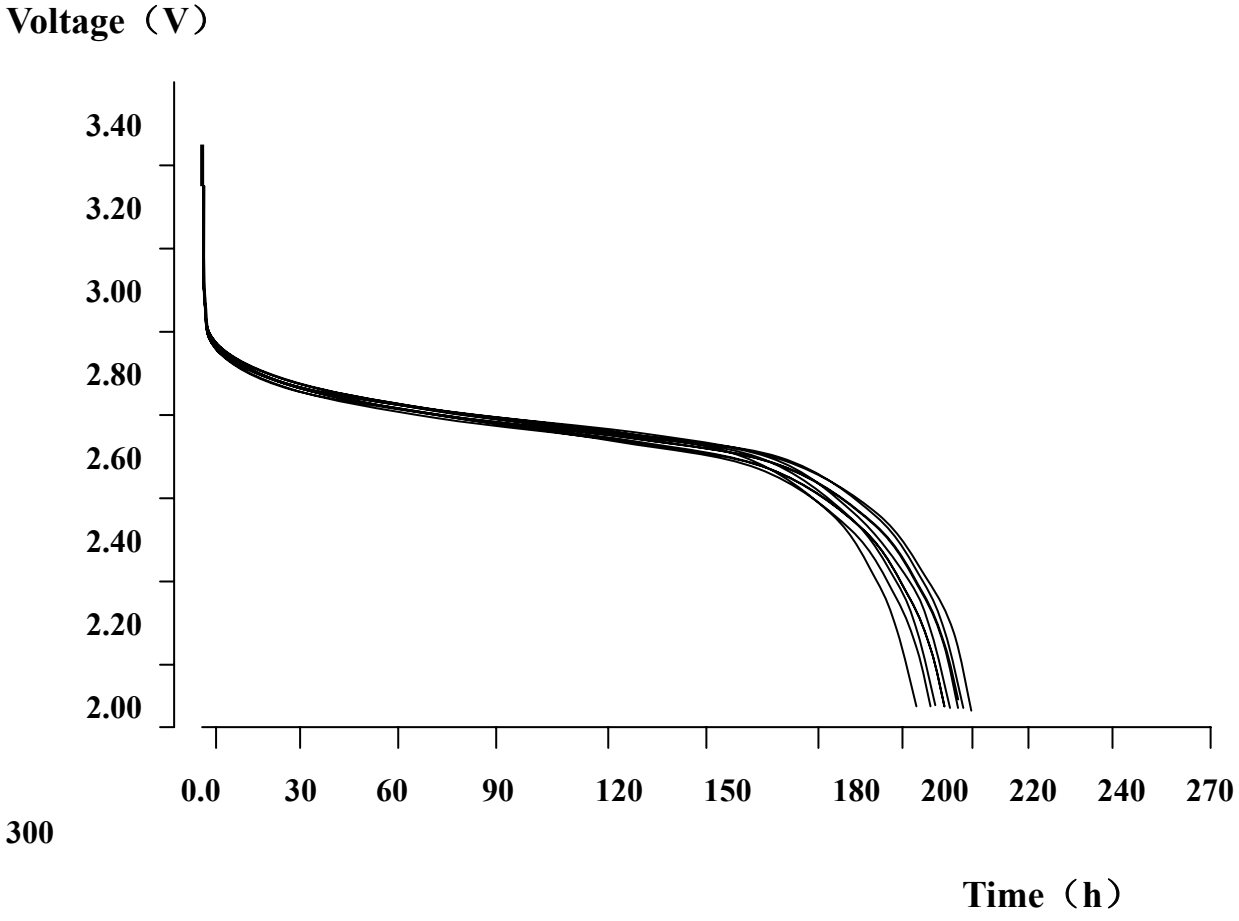
TABLE 5:

NO.	ITEM	TEST METHODS	STANDARED	
1	Dimensions	Using vernier caliper (accuracy ⩾ 0.02) while avoiding short-circuit	Diameter	20.0(-0.15)mm
			Height	3.20(-0.20)mm
2	Off-load voltage	Using multimeter (accuracy ⩾ 0.25%)internal resistance⩾1MΩ	⩾3.20V	
3	Instantaneous Short-circuit current	Time of short-circuit should be less than 0.5 Second and avoid repeated test within half an hour	⩾300mA	
4	Appearance	Eyeballing	Bright, clean, no rust, no leakage, and no flaw	
5	Capacity	Continuously discharge for 8 hour with load 3kΩ, temperature at 20-25℃, humidity at 65±20% till 2.0V end-voltage (for fresh battery only: within 3 months)	⩾200h	
6	Vibration test	Put battery on the platform of the vibrations Machine, start the machine and adjust the frequency form 10 times per minute to 15 times per minute. keep it running for an hour	Characteristics keep stability	
7	Leakage at high temperature	Stored under temperature(45℃)for 30 days	Leakage rate⩽0.5%	
8	Over Discharge Test	After 2.0V end-voltage, continuously discharged for 5 hours	No leakage allowed	

Note 1：Out shape and electrical specification of our products meet IEC 60086-2：2001（Namely GB/T8897.2-2005，Primary Batteries - Part 2）。

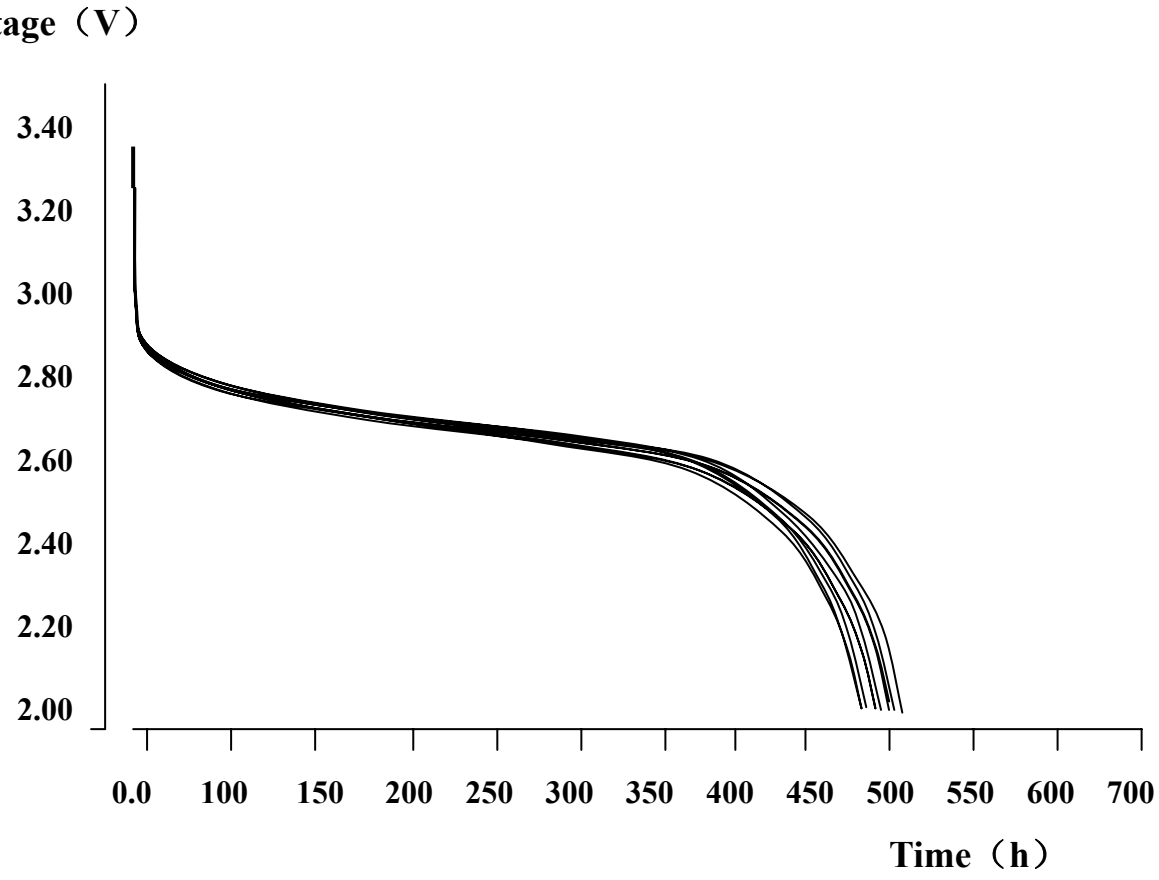
5. [DISCHARGE CHARACTERISTICS]

With load 3.0 kΩ (CR2032)



5. [DISCHARGE CHARACTERISTICS]

With load 3.0 kΩ (CR2450)



Battery CR2032 1HF drawing