

<b>Product</b>	<b>Alkaline battery, 1.5 volts</b>	Page	1 of 6
<b>Size</b>	<b>LR03, Micro, AAA - High quality</b>		

**1. Type designation:**

IEC LR03  
JIS: AM-4  
ANSI:AAA

**2. Chemical system:**

Electrolyte-zinc-manganese dioxide (mercury & cadmium free)

**3. Dimension:**

Ø 9.5-10.5  
Height: 43.3-44.5



**4. Nominal voltage:**

1.5Volts

**5. Nominal weight:**

The weight of each battery is approximately 11.2 g.

**6. Heavy Metal content (%):**

Mercury content	Cadmium	Lead
≤ 1ppm	≤ 10ppm	≤ 40ppm

**7. Appearance and terminal:**

Battery shall be clean and have no dirt, no leakage, and no deformation which may affect their performance and actual use and shall have clearly visible markings.

**8. Battery capacity:** (Test environment : 20°C±2,60%±15%R.H)

(Load resistance:**75ohms**, Daily period:**24h/d**, Cut off voltage:**0.9V** ; According to as the above the same discharge condition, the capacity of each battery is approximately:**1200mAh**)

**9. Storage characteristics:**

After 12 months storage at 20°C, 90% capacitance of fresh cells.

After 24 months storage at 20°C, 85% capacitance of fresh cells.

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## 10. Electrical characteristics:

(Test environment: 20°C±2, 60%±15%R.H) (Load resistance: **3.9ohms**, Measure time: **0.3S**)

(All samples shall be normalized for a minimum of 8 hours at the above environment prior to measurement)

	OCV (V)	CCV (V)	SCC (A)
Initial	≥ 1.59	≥ 1.45	≥ 8
After 12 months storage	≥ 1.57	≥ 1.42	≥ 6

Remark: OCV: Open Circuit Voltage; CCV: Close Circuit Voltage; SCC: Short Circuit Current

## 11. Discharge test (service life) (Test environment: 20°C±2, 45%--75%R.H)

LOAD Resistance	20Ω	24Ω	5.1Ω	10Ω	600mA	600mA
Daily Period	24h/d	15s/min, 8h/d	4min/h, 8h/day	1h/day	24h/d	10s/min, 1h/d
Cut off Voltage	0.9V	1.0V	0.9V	0.9V	0.9V	0.9V
Initial	18.3h	20h	235min	500min	42min	410times
Application	/	control	torch	Tape recorder	/	Camera flash light

Remark: The initial discharge test shall commence within 30 days of manufacture.

The discharge time is the minimum average duration (MAD).

Test quantity: n=9pcs (for per discharge test)

## 12. Leakage-proof structure:

- ① The top seal is made of imported special nylon from DUPONT, has a much stable vent pressure.
- ② The sealing location of the battery is provided with double beading scores to make the structure tighter.
- ③ Using imported special sealing glue, with more reliable leakage-proof performance.

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### 13. Safety test (Test environment: 20°C±2,60%±15%R.H)

Test item	Test method	Test pcs	Requirements
Over-discharge leakage test	20ohms (24h/d) 48hours	9pcs	No leakage
	5.1ohms (4min/h,8h/d) to 0.6V	9pcs	No leakage
	600mA (10s/min, 1h/d) to 0.6V	9pcs	No leakage
	10ohms (1h/d) to 0.6V	9pcs	No leakage
	75ohms (4h/d) to 0.6V	9pcs	No leakage
	24ohms (15s/mn, 8h/d) to 0.6V	9pcs	No leakage
High temperature test	60±2°C,RH:90±5%, after 20 days storage, the cells shall be stored in an ambient temperature of 20±2°C,RH:60±5%, for 4-24hours.	40	No leakage
One piece of battery Short circuit test	The terminal of an un-discharged battery is connected by wire. The circuit is completely for 24hours or until the case temperature has return to environment.	10	No leakage No explosion
Reversible charge	4 pieces of battery are in series connected and one of them is under incorrect polarity for 24 hours or until the case temperature has return to environment..	40	No explosion
Over discharge	One battery discharge 75ohms to 0.6V, then in series connect with 3 pieces of new battery with 20ohm 24h	36	No explosion
Four pieces of battery in series Short circuit test	The terminal of four pieces of battery is connected by wire. The circuit is completely for 24hours or until the case temperature has return to environment.	40	No explosion
Free fall test	The battery free drops from one-meter height for 6 times, then store for 1h	10	No explosion
Impact under high and low temperature	Un-discharged battery store in test box under 70±2°C for 24h,then change to -20°C for 24h, repeat the above condition for 10 cycles.	20	No explosion
Storage after partial discharge	50% discharged battery stored under 45±5°C for 30days	9	No leakage No explosion

### 14. Expiry period:

7years

### 15. Expiry period marking:

Expiry date marked on the bottom plate of finished battery . For example: 2018-08 means the Expiry date is August 2018.

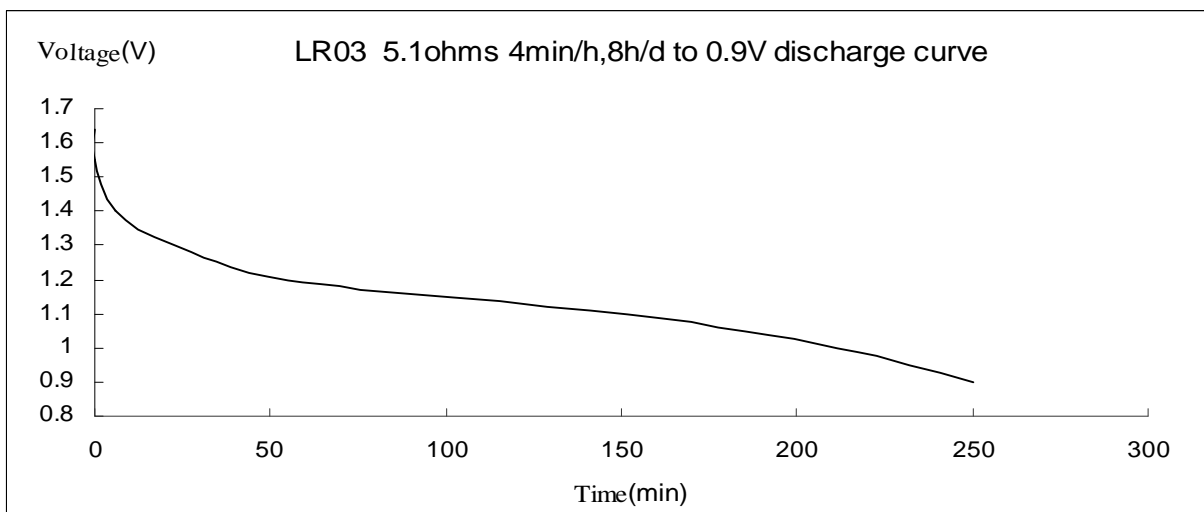
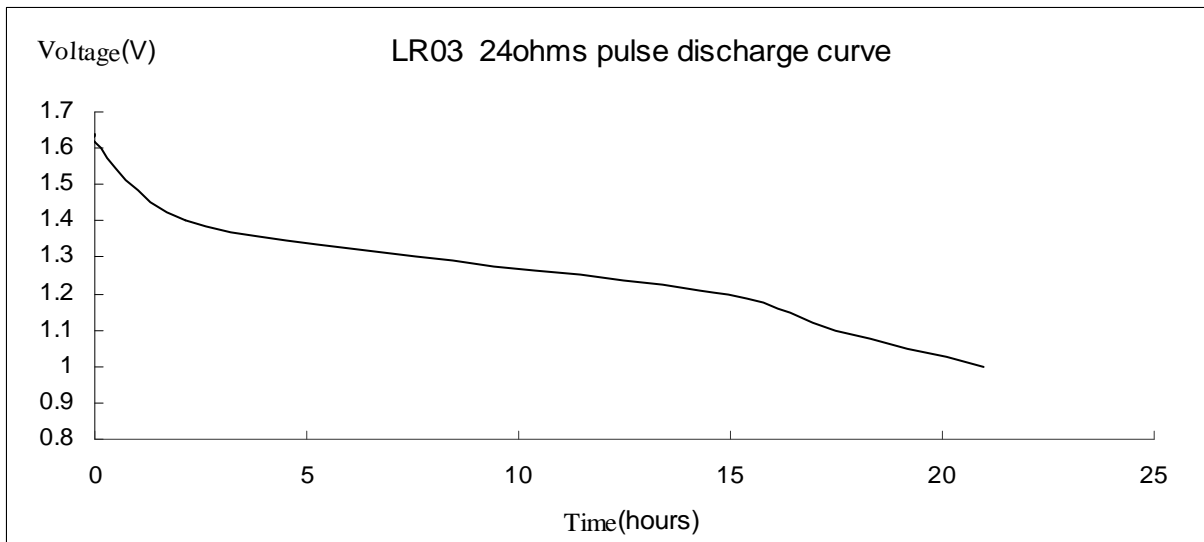
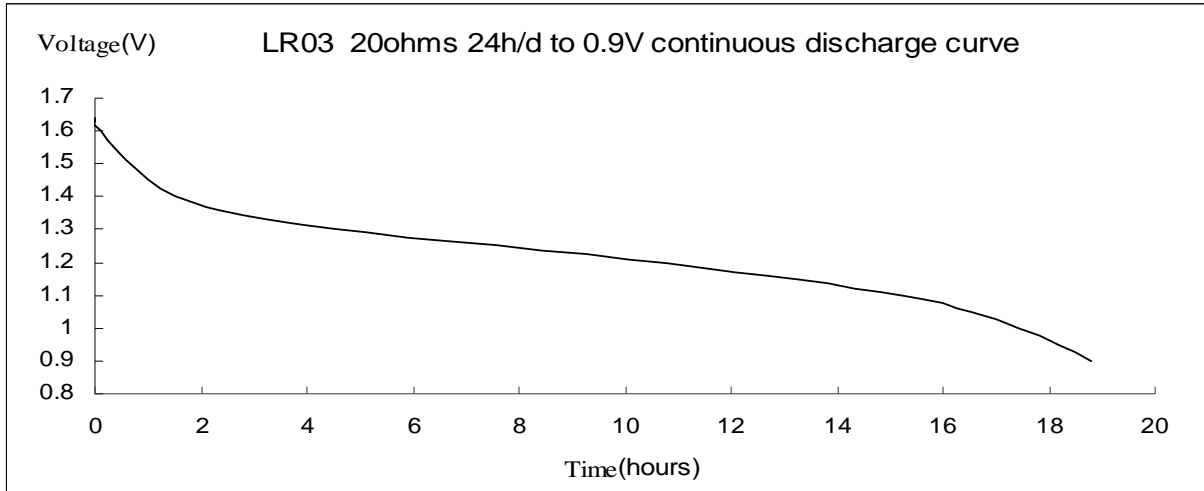
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**16. Discharge curve:**

- ① 20ohms 24h/d to 0.9V continuous discharge curve (Appendix 1)
- ② 24ohms 15s/min,8h/d to 1.0V pulse discharge curve (Appendix 1)
- ③ 5.1ohms 4min/h,8h/d to 0.9V discharge curve (Appendix 1)
- ④ 10ohms 1h/d to 0.9V intermittent discharge curve (Appendix 2)
- ⑤ 600mA 24h/d to 0.9V pulse discharge curve (Appendix 2)
- ⑥ 600mA 10s/min, 1h/d to 0.9V pulse discharge curve (Appendix 2)

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## Appendix 1



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## Appendix 2

