

1. APPLICABILITY

This specification is applicable to XTRA-POWER Alkaline Battery, LR20 (Mercury Free) .

2. GENERAL

2.1	Type designation	:	LR20
2.2	Nominal voltage	:	1.5V
2.3	Shape and dimension	:	Refer to Drawing 1
2.4	Typical weight	:	145g
2.5	Shelf life	:	5 years
2.6	Date code	:	Unless otherwise specified, every battery will carry an expiry date code for 5 years. (e.g. a battery manufactured on January 2000 will carry an expiry code of 01-2005.)
2.7	Jacket	:	Foil jacket
2.8	Heavy Metal Content	:	Hg<1ppm, Cd<10ppm, Pb<100ppm
2.9	Capacity	:	18000mAH

3. APPEARANCE

There shall be no dirt, scratch or deformation detrimental to practical service in appearance.

4. TEST METHOD

4.1 Electrical

Method of sampling	:	ISO 2859 level II single sampling normal inspection.
Voltmeter	:	Digital Voltmeter with the precision of 1mV (internal resistance not less than 1 Megohm)
Test temperature	:	20 ± 2°C

4.2 Off Load Voltage

At shipping	12 months after manufactured
1.58-1.65V	Above 1.50V

4.3 On Load Voltage

Initial	12 months after manufactured
Above 1.45V	Above 1.40V

Load resistance: 2.2 ohm ± 0.5% (measure time : 0.3 seconds)

5. SERVICE OUTPUT

5.1 Test method

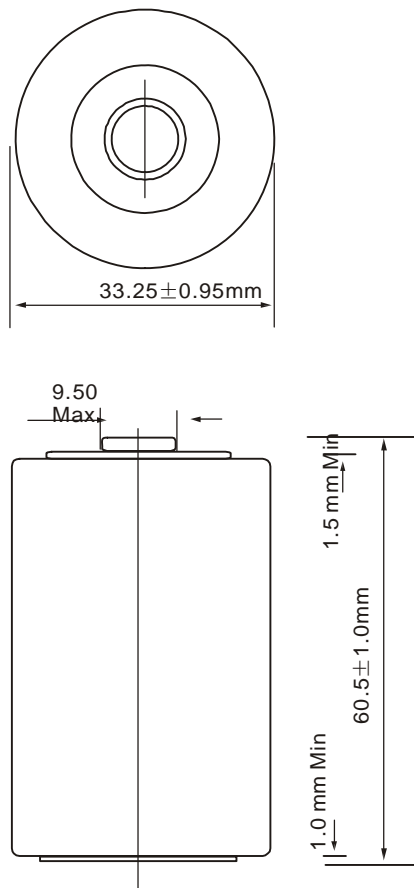
- (1) The resistance of external discharge circuit shall be as specified plus or minus 0.5%.
- (2) The duration of discharge time periods shall be as specified plus or minus 1%.
- (3) Storage shall be at $20 \pm 2^\circ\text{C}$, $65 \pm 15\%RH$ and discharge tests shall be at $20 \pm 2^\circ\text{C}$, $65 \pm 20\%RH$.

5.2 Property (Continuous discharge)

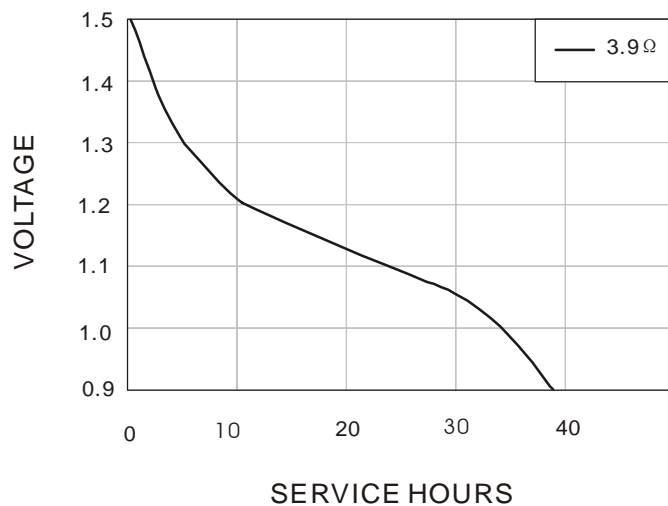
Resistance	Service Output		
	Initial		12 months after manufactured
	Minimum Average	Typical	Typical
3.9Ω (end volt = 0.9V)	35.5H	38.0H	35.5H

Test temperature : $20 \pm 2^\circ\text{C}$ H : Hour

Drawing 1: Dimensions of Battery (LR20)



TYPICAL DISCHARGE CHARACTERISTICS AT 21°C ($60 \pm 15\%RH$)



5.3 Operating temperature: -20°C to 54°C (65± 20%RH)

5.4 Storage temperature: -30°C to 55°C (65± 20%RH)

6. ELECTROLYTE LEAKAGE

6.1 Leakage on arrival at warehouse.

Leakage shall be checked with naked eye.

6.2 Leakage at room temperature

After storing for 12 months at 20 ± 15°C, 65 ± 20%RH, no leakage shall be observed with the naked eye; and no bulging exceeding the maximum dimensions shall result.

6.3 Leakage of over discharge

After loading with 3.9Ω continuously for 48 hours at 20 ± 2°C, 65 ± 20%RH, no leakage shall be observed with the naked eye; and no bulging exceeding the maximum dimensions shall result.

6.4 Leakage at high temperature

After storing for 7 days at 65 ± 2°C, no leakage shall be observed with the naked eye; and no bulging exceeding the maximum dimensions shall result.

7. QUALITY ASSURANCE

DESCRIPTION	ACCEPT PERCENTAGE
Battery dimensions	≤0.02%
Appearance	≤0.02%
Off load voltage	≤0.02%
Heavy Metal Content	Note 2.8
Service Output	Note 1
Leakage 6.1	≤0.02%

Note 1 : Acceptance/rejection in accordance with IEC publication (1993) 86-1
Sub-clause 8.B

PRECAUTION & HANDLING

- (1) Do not disassemble or short-circuit batteries.
- (2) Do not recharge batteries.
- (3) Do not dispose of batteries in fire.
- (4) Do not allow metal objects to contact the battery terminals.
- (5) Do not mix with used or other battery type (such as alkaline with carbon zinc).
- (6) Do not solder the batteries directly. If soldering or welding connection to the battery is required, consult our engineer for proper methods.
- (7) Do not over-discharge batteries. Force discharging batteries by external power source in a series may cause explosion.
- (8) To install or remove batteries, follow the equipment manufacturer's instructions.
- (9) Keep battery away from small children. If swallowed, consult a physician at once.
- (10) Remove batteries from device when it is not in use.

STORAGE

- (1) Store in cool, dry place before use.
- (2) Do not keep batteries at temperature of 55°C or above.
- (3) Do not keep batteries at relative humidity of 85% or above.