1. Applicability

This specification is applicable to GP24PL (No Mercury & Cadmium added).

2. General

2.1	Type designation	: R03(IEC/JIS),24D(ANSI)
2.2	Nominal voltage	: 1.5V
2.3	Chemical system	: (-) Zn|ZnCl2,NH4Cl|MnO2 (+)
2.4	Shape and dimension	: Refer to Drawing 1.
2.5	Weight (reference)	: 8.4g
2.6	Effective period	: 36 months
2.7	Date code	: MM-YYYY (e.g. 01-2017 represents expiry date of January, 2017)
2.8	Jacket	:Foil label (Refer to Drawing 2)

3. Appearance

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

4. Electrical Characteristics

4.1 Test method

Method of sampling : ISO2859-1 Level Ⅱ single sampling normal inspection.
Voltmeter : Digital Voltmeter (DVM) with the precision of 1mV (internal resistance not less than 1 Megohm)
Test temperature : 20±2°C

4.2 Open-circuit Voltage (OCV)

Initial	12 months	24 months
1.60～1.73V	1.54 1.73V	1.52 1.73V

4.3 Closed-circuit Voltage (CCV)

Initial	12 months	24 months
Above 1.50V	Above 1.44V	Above 1.40V

Load resistance : 15 ohm ± 0.5% (measure time : 0.8 seconds)

*The initial OCV & CCV test shall commence within 60 days of manufacture, during 61 days ~12 months storage the OCV &CCV accept/reject according to 12 months, during13 ~24 months storage the OCV &CCV accept/reject according to 24 months. During this period, the cells shall be stored under room temperature conditions.(20±2°C and 55±20% relative humidity)

5. Operating Temperature: 0°C to 45°C (60±20%RH)

6. Storage Temperature: -10°C to 25°C (60±20%RH)

7. Service Output

7.1 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±2°C, 55±20%RH and discharge tests shall be at 20±2°C, 55±20%RH.

7.2 Service Life

Discharge Items		EV	Standard	Initial		12Months	24Months	Application
				Typical	MAD	MAD	MAD	
15ΩContinuous		0.9V	-	240M	200M	190M	170M	Reference test
5.1Ω	4M/H-8H/D	0.9V	IEC60086 GB/T 8897	90M	70M	60M	58M	Portable lighting
10Ω	1H/D	0.9V	IEC60086 GB/T 8897	2.7H	2.3H	2.1H	1.9H	Digital audio
75Ω	4H/D	0.9V	IEC60086 GB/T 8897	30.0H	25.5H	23.5H	22.0H	Radio/Clock
24Ω	15S/M, 8H/D	1.0V	IEC60086 GB/T 8897	9.0H	7.5H	6.5H	6.2H	Remote control
S: Second M: Minute H: Hour D: Day EV: End-point Voltage MAD: Minimum Average Duration								

*The initial discharge test shall commence within 60 days of manufacture. The initial service life accept/reject according to initial MAD, during 61 days ~12 months storage the service life accept/reject according to 12 months MAD, during 13 ~24 months storage the service life accept/reject according to 24 months MAD.

During this period, the cells shall be stored under room temperature conditions.(20±2°C and 55±20% relative humidity)

8. Electrolyte Leakage

	Test Items	Test Conditions	Requirements
8.1	Arrival at warehouse.	within two months after shipping	There shall be no leakage observed with the naked eye, and no bulging or deformation of batteries in excess of dimensions shown in the Drawing 1
8.2	Long term storage	Within 24 months of storing at -10°C to 25°C (60±20%RH)	
8.3	High Temperature	Test specimens shall be kept standing at 45±2℃ and less than 70% RH for 30 days.	
8.4	Over-discharge	15Ω Continuous discharge until to EV=0.6V (Test conditions:20±2°C and 55±20%RH)	

9. Quality Assurance

DESCRIPTION		SAMPLING PLAN
Battery dimensions		AQL=0.25 (Note 4)
Appearance	Major defects (Rust etc.)	AQL=0.25 (Note 4)
	Minor defects (Scratch Stain etc.)	AQL=1.0 (Note 4)
Open-circuit Voltage (OCV)		AQL=0.65 (Note 4)
Closed-circuit Voltage (CCV)		AQL=1.0 (Note 4)
Service output		Note 1
Leakage 8.1		AQL=0.25(Note 4)
8.2		AQL=0.25(Note 4)
8.3		Note 2
8.4		Note 3

Note 1 : Acceptance / rejection in accordance with IEC60086-1 Sub-clause 5.3.

1) Test nine batteries.
2) Calculate the average without the exclusion of any result.
3) If this average is equal to or greater than the specified figure and no more than one battery has a service output of less than 80% of the specified figure, the batteries are considered to conform for service output.
4) If this average is less than the specified figure and/or more than one battery has a service output of less than 80% of the specified figure, repeat the test on another sample of nine batteries and calculate the average as previously.
5) If the average of this second test is equal to or greater than the specified figure and no more than one battery has a service output of less than 80% of the specified figure, the batteries are considered to conform for service output.
6) If the average of second test is less than the specified figure and/or more than one battery has a service output of less than 80% of the specified figure, the batteries are considered not to conform and no further testing is permitted.

Note 2: Sample size: n=20
Judgement: Ac=1 Re=2

Note 3: Sample size: n=9
Judgement: Ac=0, Re=1

Note 4: AQL General Inspection level II, single sampling plan.

10. Remark

Regarding the untouched items in this specification, please refer to IEC60086-1 & IEC60086 -2 & IEC60086-5

11. Packaging

11.1 Normal Packaging(See attached packing diagram）

1Pack(2pcs) 1Display Box(20Packs,40pcs) 1Inner-box(5Display Boxes,200pcs)

1Outer-box(5 Inner-Boxes,1000pcs)

11.2 Special Packaging

Packaging form shall be agreed by both parties.

12. 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.

13. Storage

1) Store in a cool, dry place before use.
2) Do not leave the batteries in an atmosphere over the temperature of 30°C or over the relative humidity of 85% for a long time.

14. Reference Specifications **(the latest edition of the referenced document applies)**

14.1 IEC60086-1/GB/T 8897.1 Primary batteries part 1: General.

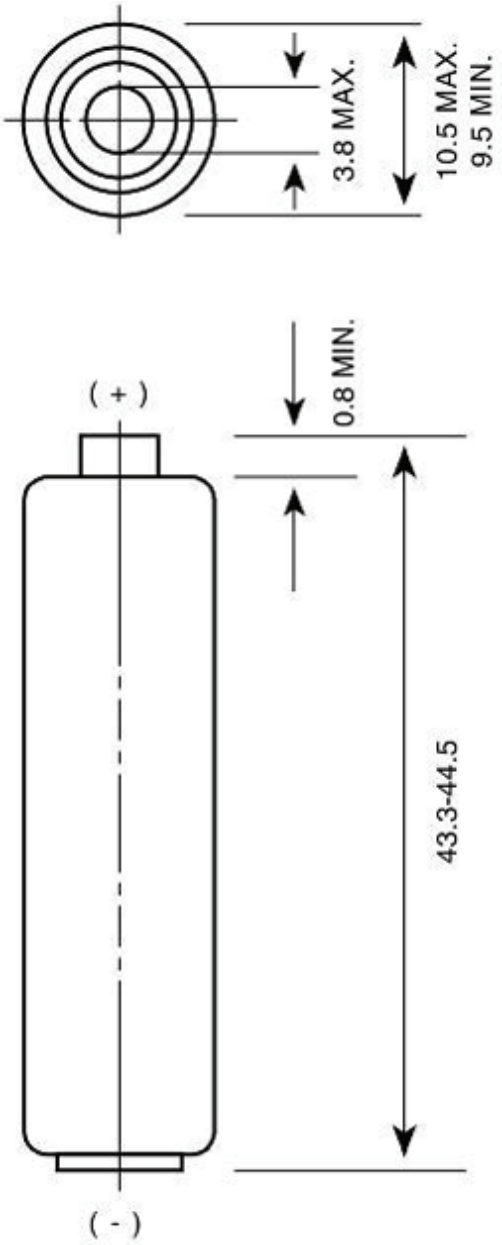
14.2 IEC60086-2/GB/T 8897.2 Primary batteries part 2: Physical and electrical specifications

14.3 IEC60086-5/GB 8897.5 Primary batteries part 5: Safety of batteries with aqueous electrolyte

14.4 ISO2859-1 Sampling procedures for inspection by attributes -- Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection

14.5 2006/66/EC: Eu Battery Directive

Drawing 1



Unit: mm

Drawing 2

Packing diagram