Specification for GP13G 1.5V R20P D size

Zinc Chloride Battery

Revision History

Revision No.	Revision Content	Issue Date
1	New specification	2010-10-6
2	Added Clause 5.3 & 5.4	2010-12-16

Approved by Customer:

Signature _____Title:_____ Date:_____

Approved by GP International Ltd.

Signature _____Title:_____ Date:_____

1. APPLICABILITY

This specification is applicable to GP13G (No Mercury & Cadmium added).

2. GENERAL

2.1	Type designation	: R20P(IEC/JIS) / 13D(ANSI)
2.2	Nominal voltage	: 1.5V
2.3	Chemical system	: Zinc Chloride
2.4	Shape and dimension	: Refer to Drawing 1.
2.5	Weight (reference)	: 97g
2.6	Effective period	: 36 months
2.7	Date code	: MM-YYYY (e.g. 01-2014 represents expiry date of January, 2014)
2.8	Jacket	: Metal jacket with insulation tube

3. APPEARANCE

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

4. CELL VOLTAGE

4.1 Test method

Method of sampling : ISO2859-1:1999 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
1.60～1.725V	1.53～1.725V

4.3 Closed-circuit Voltage (CCV)

Initial	12 months
Above 1.47V	Above 1.40V

Load resistance : 3.9 ohm ± 0.5% (measure time : 0.3 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. During this period, the cells shall be stored under room temperature conditions.(20±2°C and 60±15% relative humidity)

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±2°C, 60±15%RH and discharge tests shall be at 20±2°C, 60±15%RH.

5.2 Service Life

	Test Mode	Application	Standard	Initial		12 months	
				Typical	MAD	Typical	MAD
Service life at 20±2°C	2.2Ω4M/H, 8H/D (EPV=0.9V)	Portable lighting	IEC/ANSI	430M	370M	415M	330M
	3.9Ω 1H/D (EPV=0.9V)	Tape recorders	IEC/ANSI	15.0H	13.0H	13.5H	11.5H
	10Ω 4H/D (EPV=0.9V)	Transistor radios	IEC/ANSI	42.5H	35.0H	41.0H	32.0H
	2.2Ω 1H/D (EPV=0.8V)	Toys	IEC/ANSI	8.3H	6.5H	7.2H	5.9H
	1.5Ω4M/15M, 8H/D (EPV=0.9V)	Portable lighting (2)	IEC/ANSI	220M	170M	200M	155M
	3.9Ωcontinuous (EPV=0.9V)	Reference test		11.7H	10.0H	10.8H	9.0H

M: minute H: hour D: day EPV: 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 this period, the cells shall be stored under room temperature conditions.(20±2°C and 60±15% relative humidity)

5.3 Operating temperature: 0°C to 45°C (60±20%RH)

5.4 Storage temperature: -10°C to 25°C (60±20%RH)

6. ELECTROLYTE LEAKAGE

	Test Items	Test Conditions	Requirements
6.1	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
6.2	Long term storage	Within 24 months of storing at -10°C to 25°C (60±20%RH)	
6.3	High Temperature	Test specimens shall be kept standing at 45±2℃ and 70% RH or less for 30 days.	
6.4	Over-discharge	3.9Ω Continuous discharge until to EPV=0.6V (Test conditions:20±2°C and 60±15%RH)	

7. 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 (Note 4)
Leakage 6.1		AQL=0.25(Note 4)
6.2		Note 2
6.3		Note 2
6.4		Note 3

Note 1 : Acceptance / rejection in accordance with IEC publication 60086-1 (2007), 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.

8. PACKAGING

Packaging form shall be agreed by both parties.

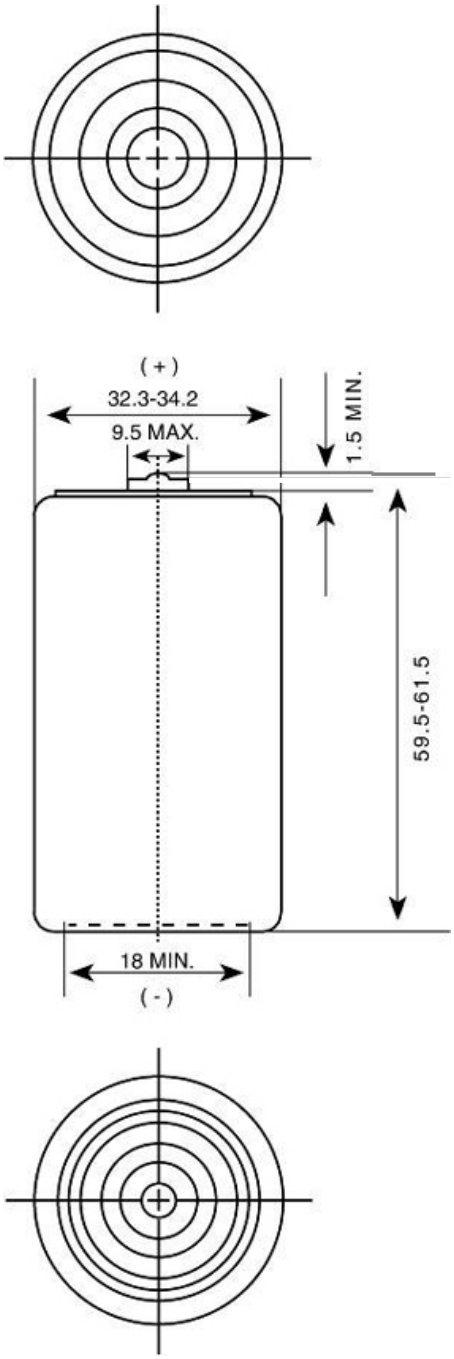
Precaution & Handling

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 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.

Drawing 1



Unit: mm