

1. APPLICABILITY

This specification is applicable to GP1604A Super Alkaline grade batteries. (GP model no.: GP1604A).

2. TYPE

- 2.1. Six layers built alkaline manganese batteries.
- 2.2. Nominal weight : 47g

3. NOMINAL VOLTAGE

9 Volts.

4. TERMINALS

Nickel-plated miniature snap fasteners.

5. SHELL

Printed metal jacket.

6. IDENTIFICATION

Expiry code of 6 digits (MM-YYYY) will be printed on the bottom of each battery.

7. QUALITY REQUIREMENT

7.1 Conventions:

- n = Number of batteries to be tested.
- c = Permissible number of defects.
- k = Actual number of defects.
- x = Average of (n-k) good result.
- N0 = Test within 3 months of ex-factory.
- N12 = Test within 12 months of manufacture code.
- N18 = Test within 18 months of manufacture code.
- N36 = Test within 36 months of manufacture code.
- N60 = Test within 60 months of manufacture code.

7.2 Test conditions:

- 7.2.1 All tests (Voltage, Storage, Service life etc) shall be performed at ambient temperature of $25 \pm 2^\circ\text{C}$ and relative humidity of $60 \pm 15\%RH$.
- 7.2.2 Voltmeter shall has a resolution of $\pm 0.01\text{ V}$ and with internal impedance of $1\text{ M}\Omega$ minimum.
- 7.2.3 Unless otherwise stated, samples for acceptance testing shall be selected per MIL-STD-105E, LEVEL II normal inspection.

7.3 Shelf life : 5 years as below conditions,

7.3.1 Open circuit voltage [OCV]

	Minimum voltage (V)	AQL
N0	9.30	0.65%
N12-N24	9.20	0.65%
N36	9.00	0.65%
N60	8.80	0.65%



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7.3.2 Closed circuit voltage [CCV] (Load 47 Ω for 0.3 seconds).

	Minimum voltage (V)	AQL
NO	8.00	0.65%
N12	7.80	0.65%
N36	7.50	0.65%
N60	7.20	0.65%

7.3.3 Service life (Batteries tested shall comply with either one of the following requirements.)

7.3.3.1 Requirements (* Storage performance is estimated)

Resistance	Discharge duration	End Voltage	SPECIFICATIONS (Hrs), Mean			
			NO	N12	N36	N60
			Mean	Mean	Mean	Mean
270 Ω	1 h/d	5.40V	20.0	19.7	18.2	16.2
620 Ω	2 h/d	5.40V	48.2	47.2	44.7	40.7
10 k Ω background 24 h/d, 620 Ω 1 s/h pulse		7.50V	SPECIFICATIONS (days), Mean			
			19.0	18.5	17.5	16.5*

7.3.3.2 n=10, c=1. In case of k=2, one retest is allowed.

7.4 External leakage

7.4.1.1 No leakage when CCV drops by 40% of nominal voltage for the first time.

7.4.1.2 No leakage during storage for 30 days under 45 \pm 2 $^{\circ}$ C 70%RH.

7.4.2 For undischarged batteries.

	AQL
NO	0.65%
N12	0.65%
N18	0.65%

7.5 Appearance

	AQL
Major defects	0.65%
Minor defects	0.65%

- | | |
|---------------|--------------------------------------|
| Major defects | 1) Loose or damaged terminals |
| | 2) Incorrect polarity. |
| | 3) Visible rust on metal parts. |
| Minor defects | 1) Substandard appearance. |
| | 2) Heavy scratches. |
| | 3) Serious deformation. |
| | 4) Serious displacement of artworks. |



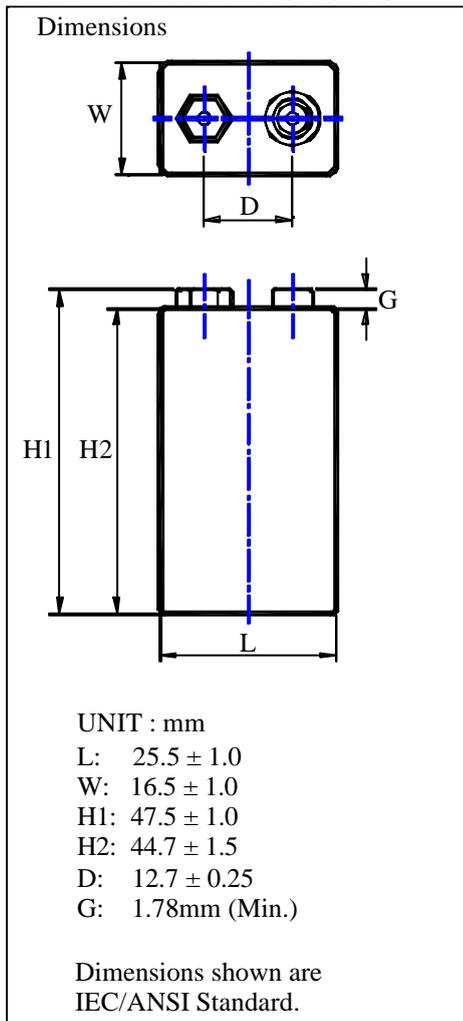
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8 MERCURY FREE AND CADMIUM FREE

8.1 Mercury - 1 ppm maximum per battery weight.

8.2 Cadmium - 3 ppm maximum per battery weight.

9 BATTERY DIMENSIONS



10. STORAGE AND OPERATING TEMPERATURE

10.1 Operating Temperature : -20 ~ 60 °C, 65 % RH Max.

10.2 Storage Temperature : 15 ~ 25 °C, 45 ~ 75 % RH.

