

Charging

■ Charging circuits

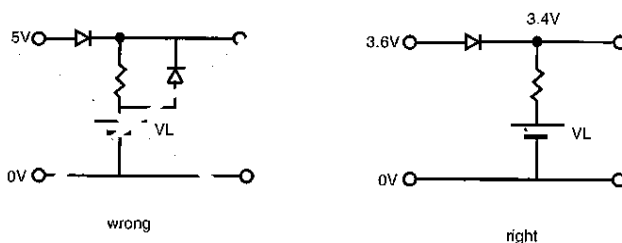
Charging/discharging cycle	Approx. 1,000 times at 10% discharge depth to nominal capacity
Charging system*	Constant-voltage charging.(Please strictly adhere to the specified charge voltage)
Operating temperature	-20°C ~ +60°C

* Consult with Panasonic concerning constant-current charging systems.

The charging circuit is crucial in terms of ensuring that full justice will be done to the battery characteristics. Consider it carefully as the wrong charging circuit can cause trouble.

■ Precautions regarding the charge voltage setting

Under no circumstances should trickle charging, which is used for nickel-cadmium batteries, be used. Ignoring this precaution will cause the battery voltage to rise to about 5V, resulting in a deterioration of performance.



■ Charge voltage range

If a fixed-charging method is applied, please adhere to the specified charging voltage.

The guaranteed value over an operating temperature range from -20 to +60°C is $3.4V \pm 0.15V$. (Actual value: $3.4V \pm 0.20V$)

* If the charging voltage exceeds the specifications, the internal resistance of the battery will rise and may cause battery deterioration. Also, with a charge voltage around 4V, corrosion of the (+) terminal (case) may occur, causing leakage. ("Influence of the charge voltage on VL batteries" in Chapter 3-59.)

* It is not possible for the battery capacity to recover completely when the charging voltage is below the specification.

■ Recommended charging circuits

● Basic conditions

Charge voltage: $3.4V \pm 0.15V$

Charge current: For a battery voltage of 3V

VL621 Approx. 0.2 mA or below

VL1216, VL1220 Approx. 0.5 mA or below

VL2020 Approx. 1.5 mA or below

VL2320, VL2330 Approx. 2.0 mA or below

VL3032 Approx. 4.0 mA or below

(It is permissible for the current to increase beyond the above level when the battery voltage drops below 3V.)

■ Mixed usage of batteries

Do not use these batteries and lithium primary batteries or other rechargeable batteries together, and do not use new batteries and old batteries together even if they are of the same type.