

## Battery Handling and Precautions

### Safety

|                        |  |
|------------------------|--|
| Don't Dismantle        | Do not disassemble or modify the battery pack. The battery pack is equipped with built-in safety/protection features. Should these features be disabled, the battery pack can leak, emitting corrosive liquid, or it would overheat, burst or ignite.  |
| Don't Short Circuit    | Do not connect the positive (+) and negative (-) terminals with a metal object such as wire. Do not transport or store the battery pack together with metal objects such as necklaces, hair pins, etc. Otherwise, short-circuiting will occur, overcurrent will flow, causing the battery pack to leak electrolyte, overheat, emit smoke, burst and/or ignite, or the metal objects such as wire, necklaces or hair pin can generate heat. |
| Don't Put Into Fire    | Do not discard the battery pack into fire or heat it. Otherwise, its insulation can melt down. Its gas release vent or safety features will be damaged and/or its electrolyte can ignite, possibly leading to acid leakage, overheating, smoke emission, bursting and/or ignition on it.   |
| Don't Put Into Water   | Do not immerse the battery pack in water or seawater, and do not allow it to get wet. Otherwise, the protective features in it can be damaged. It can be charged with extremely high current and voltage, abnormal chemical reactions may occur in it, possibly leading to acid leakage, overheating, smoke emission, bursting and/or ignition.  |
| Don't Pierce           | Do not pierce the battery pack with a nail or other sharp objects, strike it with a hammer, or step on it. Otherwise, the battery pack will become damaged and deformed, internal short-circuiting can occur, possibly leading to acid leakage, overheating, smoke emission, bursting and/or ignition.   |
| Don't Strike Or Throw  | Do not strike or throw the battery pack. Otherwise, the protective feature in it may become damaged, it can be charged with extremely high current and voltage, abnormal chemical reactions can occur in it, possibly leading to acid leakage, overheating, smoke emission, bursting and/or ignition.  |
| Don't Direct Soldering | Do not solder directly onto batteries. Always solder onto solder tag for connection. Otherwise, heat can melt down its insulation, damage its gas release vent or safety features possibly leading to acid leakage, overheating, smoke emission, bursting and/or ignition on it.   |

Distributed by:

# GP Batteries

## WORLDWIDE HEADQUARTERS HONG KONG

### GPI INTERNATIONAL LIMITED

Gold Peak Building, 8/F, 30 Kwai Wing Road,  
Kwai Chung, N.T., Hong Kong  
Tel: (852) 2484 3333 Fax: (852) 2480 5912  
E-mail address: gpil@goldpeak.com  
Website: <http://www.gpbatteries.com.hk>

## SALES & MARKETING BRANCH OFFICES

ASEAN  
GP BATTERY MARKETING (SINGAPORE) PTE. LIMITED  
37 Pioneer Road, Singapore 639579  
Tel: (65) 6559 9760 Fax: (65) 6559 9761

MALAYSIA  
GP BATTERY MARKETING (MALAYSIA) SDN. BHD.  
Lot 8, Jalan Pemberita U1/49,  
Temasya Industrial Park,  
40150 Shah Alam, Selangor Darul Ehsan, Malaysia  
Tel: (60) 3 5569 3499 Fax: (60) 3 5569 3498

THAILAND  
GP BATTERY MARKETING (THAILAND) CO., LTD.  
102 Soi Sukhumvit 26, Sukhumvit Road,  
Klongton, Klongtoey,  
Bangkok 10110 Thailand  
Tel: (66) 2 661 3688 Fax: (66) 2 661 3602

TAIWAN  
GOLD PEAK INDUSTRIES (TAIWAN) LIMITED - TAIPEI OFFICE  
8/F, No. 205 Sec. 1, Fu Xing South Road,  
Taipei 10666, Taiwan, R.O.C.  
Tel: (886) 2 2772 9998 Fax: (886) 2 2731 4868/2741 0192

CHINA  
HUIZHOU CHAO BA BATTERY TECHNOLOGY CO., LTD  
2/F, South of Hongye Industrial Building,  
Tianluo Mountain, 14th Industrial District,  
Huizhou City, Guangdong, China  
(Postal Code: 516003)  
Tel: (86) 752 282 8428 Fax: (86) 752 280 2872

HONG KONG  
GP BATTERY MARKETING (H.K.) LIMITED  
Gold Peak Building, 8/F, 30 Kwai Wing Road,  
Kwai Chung, N.T., Hong Kong  
Tel: (852) 2420 0281 Fax: (852) 2494 9349

KOREA  
GP BATTERY MARKETING (KOREA) LIMITED  
Kunsul Hoekwan Building, 9/F, 71-2 Non Hyun-Dong,  
Kang Nam-Gu, Seoul, South Korea  
Tel: (82) 2 549 7188/9, 2 516 3936/7  
Fax: (82) 2 514 0623, 2 516 0621

U.S.A.  
GOLD PEAK INDUSTRIES (NORTH AMERICA) INC.  
11235 West Bernardo Court, San Diego,  
CA 92127-1638, U.S.A.  
Tel: (1) 858 674 6099 Fax: (1) 858 674 6496/674 5883

CANADA  
GP BATTERY MARKETING INC.  
Unit 7, 7780 Woodbine Avenue, Markham,  
Ontario, Canada L3R 2N7  
Tel: (1) 905 474 9507 Fax: (1) 905 474 9452

LATIN AMERICA  
GP BATTERY MARKETING (LATIN AMERICA) INC.  
8370 NW, 66th Street, Miami, Florida 33166, U.S.A.  
Tel: (1) 305 471 7717 Fax: (1) 305 471 7718

EUROPE  
GP BATTERIES EUROPE B.V.  
Kortijzer 4, 5721 VE Asten,  
The Netherlands  
Tel: (31) 493 681030 Fax: (31) 493 681039

GERMANY  
GP BATTERY MARKETING (GERMANY) GMBH  
Niederlorticker Str. 62, 40667 Meerbusch, Germany  
Tel: (49) 2132 1377-0 Fax: (49) 2132 1377-13

POLAND  
GP BATTERY (POLAND) SP. Z.O.O.  
ul. Slowicza 19, PL-02170 Warsaw, Poland  
Tel: (48) 22 868 0490 Fax: (48) 22 846 7535

U.K.  
GP BATTERIES (U.K.) LIMITED  
Summerfield Avenue,  
Chelston Business Park, Wellington,  
Somerset, TA21 9JF, United Kingdom  
Tel: (44) 1 823 660 044 Fax: (44) 1 823 665 595

ITALY  
GP BATTERY MARKETING ITALY S.R.L.  
Via Alessandro Volta 3,  
20094 Assago (MI), Italy  
Tel: (39) 02 488 2512 Fax: (39) 02 488 2865


SCANDINAVIA  
GPBM NORDIC AB  
Grimboasen 5, SE-417 49, Goteborg, Sweden  
Tel: (46) 31 558 600 Fax: (46) 31 556 813

# GP Batteries

## Lithium Ion Rechargeable Batteries



GPPA4RBL-A 05/06 All rights reserved. No parts of this catalogue written or pictorial may be reproduced without the permission of GPI International Ltd.



# Lithium Ion Rechargeable Batteries

Increased demand for portable electronic appliances has expanded the spectrum of battery applications to a wider extent. The new advanced appliances are looking for batteries with longer running-hours, lighter weight and higher energy density. Among all the existing rechargeable battery systems, Lithium Ion technology is, and will continue to be the most logical power force for the portable age. GP Batteries, one of the world's top-ten battery manufacturers, offers a wide range of ultra-high performance cylindrical and prismatic Li-ion batteries to meet market needs.

GP Batteries owes its success to 40 years of battery making experience, continuous efforts in R&D, cutting edge technology and advanced equipment. Today, GP Batteries has its manufacturing, marketing and distribution operations in 15 countries serving both retail and OEM markets. Take full advantage of GP's advanced technology and quality Li-ion batteries for better performance, and for more opportunities.

## Major Features

- High Energy Density**  
 Advanced technology provides ultra-high capacity performance for GP Li-ion batteries.
- Variety of Sizes and Capacities**  
 Our expanding list of models encompasses a wide range of battery sizes and capacities, making it convenient in various applications.
- Wide Operating Temperature Range**  
 GP Li-ion batteries can be charged over a temperature range of 0°C to 45°C, and discharged between -30°C to 60°C.
- Designed for Safe Operation**  
 All batteries are equipped with multiple safety features, including safe shut-down separator and safety vent.
- High-Output and High-Load Characteristics**  
 Capable of continuously discharge at 2C rate. Effective for large power consumption applications, such as Notebook, PC etc.
- Stable Operating Voltage**  
 Relatively gentle decreases in discharge voltage enhances the operating stability of the applications.
- Good Charge Retention**  
 Charged GP Li-ion batteries can be stored for long period with high residual capacity, because of low self-discharge rate.
- No Memory Effect**  
 The discharge performance is not affected even when the batteries are subjected repeatedly to shallow discharge cycles. There is thus no need to pre-discharge the batteries before charging.
- Long Cycle Life**  
 GP Li-ion batteries offers stable capacity and performance for hundreds of cycles, thus providing a great value over its life time.
- ISO Accreditation**  
 GP's manufacturing plants are accredited with QS9000, ISO 14001 and OHSAS 18001 certificates. International quality standards in terms of design, manufacturing and environmental management are guaranteed.

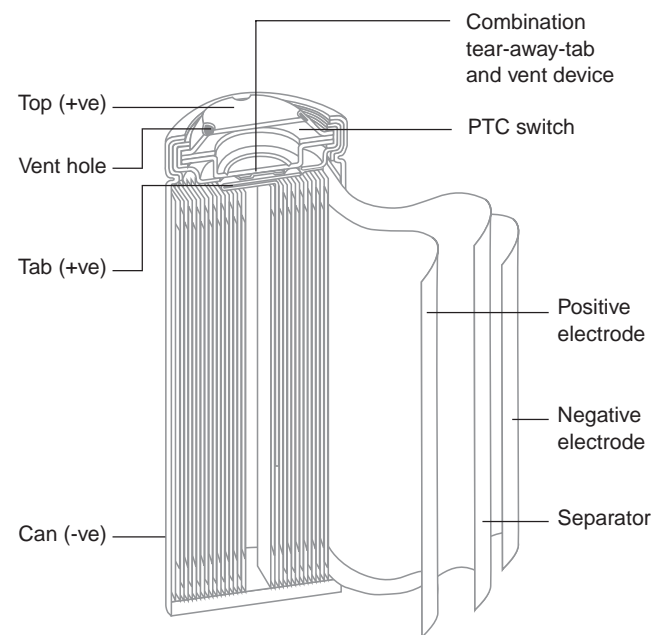


## Major Applications

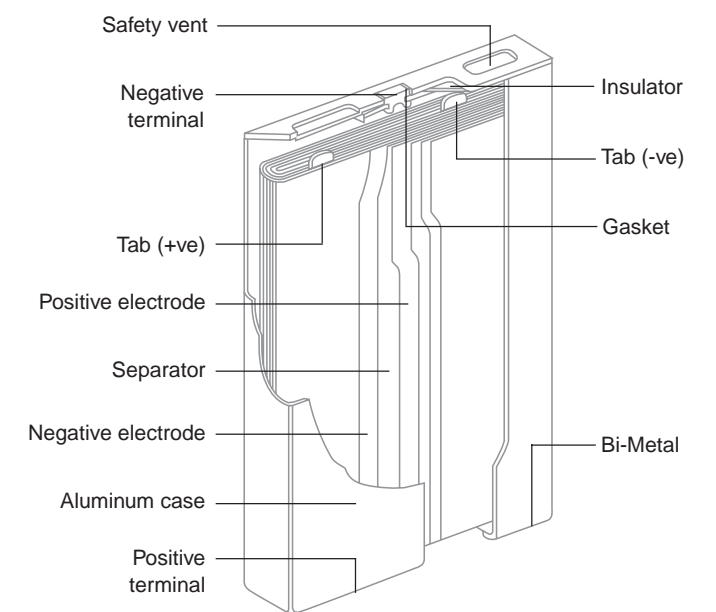
Notebook Computers, Cellular Phones, Digital Cameras, Camcorders, Video CD/DVD Players, MD Players, PDAs/Webpad, POS Terminals, Electronic Instruments, Communication Devices, etc.

## Cell Construction

### Cylindrical



### Prismatic



# Lithium Ion Rechargeable Batteries

## Cylindrical Models

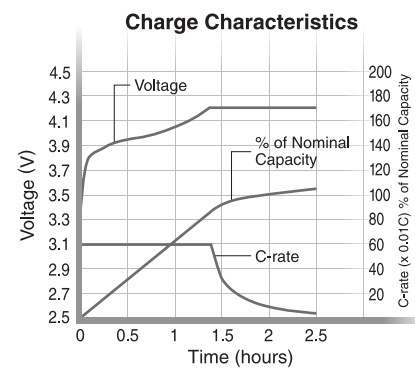
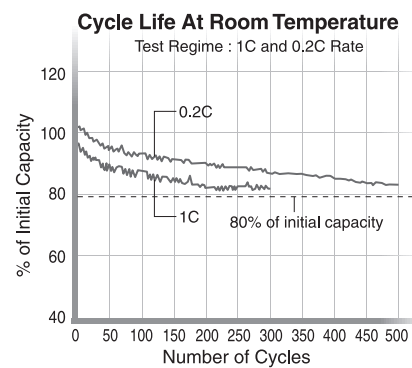
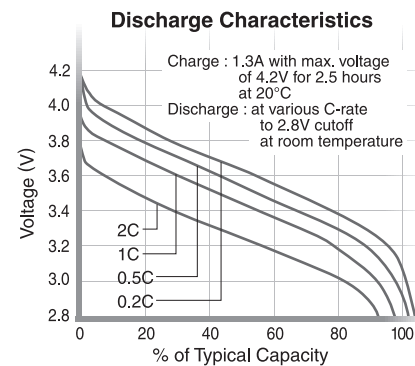
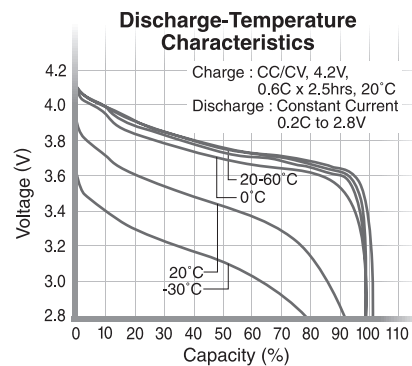
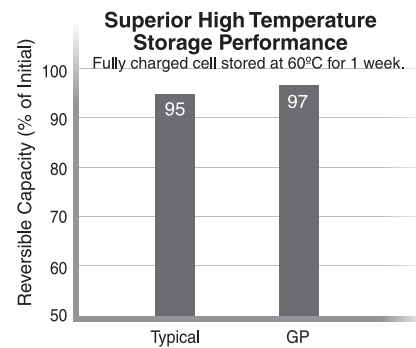
### Specifications

| Model No.    | Nominal Voltage (V) | Capacity (mAh) |         | Dimension (mm) |        | Weight (g) | Maximum Discharge Current (mA) | Maximum Charging Voltage (V) | Maximum Charging Current (mA) |
|--------------|---------------------|----------------|---------|----------------|--------|------------|--------------------------------|------------------------------|-------------------------------|
|              |                     | Typical        | Minimum | Diameter       | Height |            |                                |                              |                               |
| GP1018L10*   | 3.7                 | 105            | 90      | 10.5           | 18.0   | 3.6        | 210                            | 4.2                          | 105                           |
| GP1022L14*   | 3.7                 | 145            | 130     | 10.5           | 22.0   | 4.2        | 290                            | 4.2                          | 145                           |
| GP1029L20*   | 3.7                 | 205            | 190     | 10.5           | 29.0   | 6.0        | 410                            | 4.2                          | 205                           |
| GP1051L35*   | 3.7                 | 355            | 340     | 10.5           | 51.0   | 10.3       | 710                            | 4.2                          | 355                           |
| GP0836L15*   | 3.7                 | 155            | 140     | 8.3            | 36.0   | 4.5        | 310                            | 4.2                          | 155                           |
| GP0838L15    | 3.7                 | 155            | 140     | 8.3            | 38.0   | 4.5        | 310                            | 4.2                          | 155                           |
| GP0840L18    | 3.7                 | 180            | 165     | 8.3            | 40.0   | 4.8        | 360                            | 4.2                          | 180                           |
| GP1443L68*   | 3.7                 | 680            | 630     | 14.2           | 43.0   | 16.0       | 1360                           | 4.2                          | 680                           |
| GP1450L85    | 3.7                 | 850            | 800     | 14.2           | 50.0   | 19.0       | 1700                           | 4.2                          | 850                           |
| GP1465L115   | 3.7                 | 1150           | 1100    | 14.2           | 65.0   | 26.0       | 1725                           | 4.2                          | 1150                          |
| GP1750L125   | 3.7                 | 1250           | 1200    | 17.0           | 50.0   | 26.0       | 1875                           | 4.2                          | 1250                          |
| GP1767L185*  | 3.7                 | 1850           | 1800    | 17.0           | 67.0   | 37.0       | 1850                           | 4.2                          | 1850                          |
| GP1850L140*  | 3.7                 | 1400           | 1350    | 18.5           | 50.0   | 31.0       | 2100                           | 4.2                          | 1400                          |
| GP1865L200S* | 3.7                 | 2050           | 2000    | 18.5           | 65.5   | 43.0       | 2050                           | 4.2                          | 2050                          |
| GP1865L220*  | 3.7                 | 2200           | 2150    | 18.5           | 65.5   | 44.0       | 2200                           | 4.2                          | 2200                          |

Typical Ambient Temperature : Charge : 0°C to 45°C / Discharge : -30°C to 60°C / Storage : -20°C to 45°C

\* UL recognized model

### Performance Characteristics



### Configurations For soft packs of GP18650 Lithium Ion batteries.

| Configuration Code | 3-D View (unit in mm) | End View | Standard Protection Module (unit in mm) | Voltage (V) |
|--------------------|-----------------------|----------|---|-------------|
| 1S1P               |                       |          | PART NO.: PCBVL001<br>                  | 3.7         |
| 1S2P               |                       |          | PART NO.: PCBL1S2P-B/BF<br>             | 3.7         |
| 2S1P               |                       |          | PART NO.: PCBL2S1P-A<br>                | 7.4         |
| 2S2P               |                       |          | PART NO.: PCBL2S2P-B/BF<br>             | 7.4         |
| 3S1P               |                       |          | PART NO.: PCBDR202A<br>                 | 11.1        |
| 3S2P               |                       |          | PART NO.: PCBDR202A<br>                 | 11.1        |
| 3S3P               |                       |          | PART NO.: PCBDR202A<br>                 | 11.1        |
| 4S2P               |                       |          | PART NO.: PCBL4S2P-B/BF<br>             | 14.8        |

\* Apart from the standard items shown above, customised configurations are also available upon request.

# Lithium Ion Rechargeable Batteries

## Prismatic Models

### Specifications

| Model No.      | Nominal Voltage (V) | Capacity (mAh) |         | Dimension (mm)#             |        | Weight (g) | Maximum Discharge Current (mA) | Maximum Charging Voltage (V) | Maximum Charging Current (mA) |
|----------------|---------------------|----------------|---------|-----------------------------|--------|------------|--------------------------------|------------------------------|-------------------------------|
|                |                     | Typical        | Minimum | Diameter                    | Height |            |                                |                              |                               |
| GP413048L68*   | 3.7                 | 680            | 650     | 4.1(T) x 30.0(W) x 48.0(H)  | 16     | 1360       | 4.2                            | 680                          |                               |
| GP413443L63*   | 3.7                 | 630            | 600     | 4.1(T) x 34.0(W) x 43.0(H)  | 14     | 1260       | 4.2                            | 630                          |                               |
| GP413450L78*   | 3.7                 | 780            | 750     | 4.1(T) x 34.0(W) x 50.0(H)  | 17     | 1560       | 4.2                            | 780                          |                               |
| GP503020L21*   | 3.7                 | 210            | 180     | 5.0(T) x 30.1(W) x 20.0(H)  | 7      | 420        | 4.2                            | 210                          |                               |
| GP503040L54*   | 3.7                 | 540            | 510     | 5.0(T) x 30.1(W) x 40.0(H)  | 13     | 1080       | 4.2                            | 540                          |                               |
| GP503048L78    | 3.7                 | 780            | 750     | 5.0(T) x 30.1(W) x 48.0(H)  | 17     | 1560       | 4.2                            | 780                          |                               |
| GP503436L60R*  | 3.7                 | 600            | 570     | 5.0(T) x 34.0(W) x 36.1(H)  | 14     | 1200       | 4.2                            | 600                          |                               |
| GP503449L98R*  | 3.7                 | 980            | 950     | 5.0(T) x 34.0(W) x 49.4(H)  | 19     | 1960       | 4.2                            | 980                          |                               |
| GP582231L37*   | 3.7                 | 370            | 340     | 5.8(T) x 22.0(W) x 31.0(H)  | 9      | 740        | 4.2                            | 370                          |                               |
| GP582237L43*   | 3.7                 | 430            | 400     | 5.8(T) x 22.0(W) x 37.1(H)  | 11     | 860        | 4.2                            | 430                          |                               |
| GP582248L57*   | 3.7                 | 570            | 540     | 5.8(T) x 22.0(W) x 48.0(H)  | 16     | 1140       | 4.2                            | 570                          |                               |
| GP603450L114R* | 3.7                 | 1140           | 1110    | 6.0(T) x 34.1(W) x 50.0(H)  | 24     | 2280       | 4.2                            | 1140                         |                               |
| GP603465L144   | 3.7                 | 1440           | 1410    | 6.0(T) x 34.0(W) x 65.0(H)  | 32     | 2880       | 4.2                            | 1440                         |                               |
| GP623040L74*   | 3.7                 | 740            | 710     | 6.2(T) x 30.0(W) x 40.0(H)  | 17     | 1480       | 4.2                            | 740                          |                               |
| GP623048L104*  | 3.7                 | 1040           | 1000    | 6.2(T) x 30.0(W) x 48.0(H)  | 21     | 2080       | 4.2                            | 1040                         |                               |
| GP743442L118R* | 3.7                 | 1180           | 1150    | 7.4(T) x 34.0(W) x 42.0(H)  | 23     | 2360       | 4.2                            | 1180                         |                               |
| GP813433L75*   | 3.7                 | 750            | 720     | 8.1(T) x 34.0(W) x 33.0(H)  | 21     | 1500       | 4.2                            | 750                          |                               |
| GP813448L130*  | 3.7                 | 1300           | 1270    | 8.1(T) x 34.0(W) x 48.0(H)  | 30     | 2600       | 4.2                            | 1300                         |                               |
| GP843042L105*  | 3.7                 | 1050           | 1020    | 8.4(T) x 30.0(W) x 42.0(H)  | 23     | 2080       | 4.2                            | 1040                         |                               |
| GP863734L120R* | 3.7                 | 1200           | 1170    | 8.6(T) x 37.0(W) x 34.0(H)  | 24     | 2400       | 4.2                            | 1200                         |                               |
| GP901940L63R*  | 3.7                 | 630            | 600     | 9.2(T) x 19.1(W) x 40.0(H)  | 15     | 1260       | 4.2                            | 630                          |                               |
| GP901942L70R*  | 3.7                 | 700            | 670     | 9.2(T) x 19.1(W) x 42.0(H)  | 16     | 1400       | 4.2                            | 700                          |                               |
| GP901948L80R*  | 3.7                 | 800            | 770     | 9.2(T) x 19.1(W) x 48.0(H)  | 17     | 1600       | 4.2                            | 800                          |                               |
| GP103450L180R* | 3.7                 | 1850           | 1800    | 10.0(T) x 34.0(W) x 50.0(H) | 38     | 2775       | 4.2                            | 1850                         |                               |

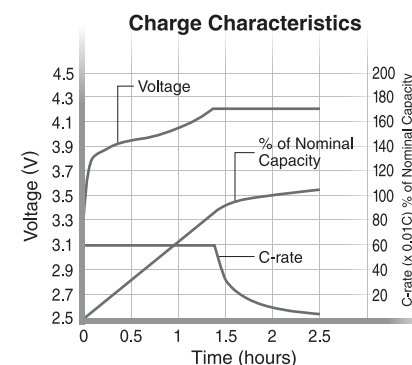
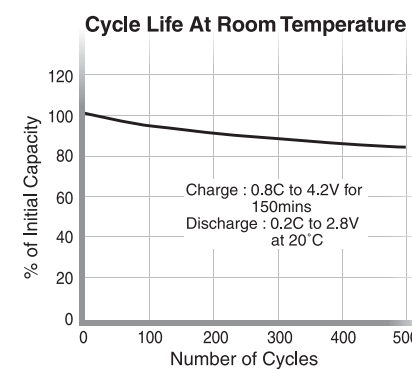
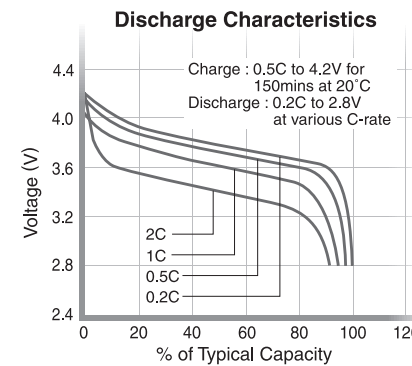
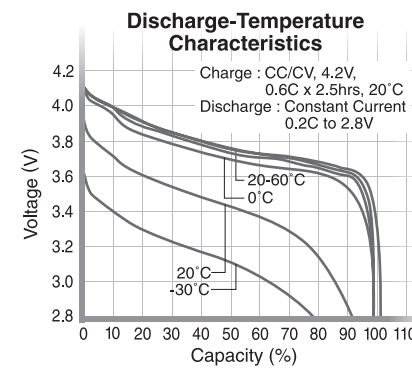
Typical Ambient Temperature : Charge : 0°C to 45°C / Discharge : -30°C to 60°C / Storage : -30°C to 45°C

\* UL recognized model

# Dimension of bare cell before charging and cycling.



### Performance Characteristics



### Battery Handling and Precautions

#### Charge

**Charge Voltage** Charge to 4.20 +0/-0.05V per cell, each being supervised.

**Charge Current** Do not exceed 1C charging rate.

**Charge Temperature** Charge in the range of 0 to 45°C.

#### Discharge

**Discharge Current** Size the discharge over-current protection elements to be able to take the maximum current.

**Discharge Temperature** Discharge in the range of -20 to 60°C. For prismatic models, the lowest discharge temperature is -30°C.

**Overdischarge** Do not discharge below 2.8V/cell under significant loads. Small leakage current may discharge the cell further in some devices even after shut down.

#### Storage

**Storage Temperature** Store at -20 to 45°C. Significant permanent loss can occur when storing at 60°C for prolonged period. Keep the battery away from fire. For prismatic models, the lowest storage temperature is -30°C.

**Long Term Storage** Deterioration of cell capacity is slower at lower state of charge. Store at below 50% state of charge or about 3.7V. For extended storage period over one year, recharge the battery to 3.7V to prevent overdischarge of the battery.

#### Equipment Design

**Reverse Polarity Prevention** Provide mechanical stop so that the battery pack cannot be inserted in a reverse manner. The electrical contacts should be designed so that they are difficult to short.

**Battery Location** Elements like solid state safety circuit should be mounted so that they are not subjected to high temperature or electromagnetic field emanating from the device it is powering or being charged by.

**Damage Prevention Due to Drop** The wiring and cells should be protected inside the battery pack by designing so that they are difficult to short.