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:

GPPA4RBL-A 12/04

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: gpii@goldpeak.com
Website: http://www.gpbatteries.com.hk

SALES & MARKETING BRANCH OFFICES

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

MALAYSIA
GP BATTERY MARKETING (MALAYSIA) SDN. BHD.
Lot 9, 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
Room 1200, International Trade Building, No.205 Sec.1,
Tun Hua South Road, Taipei 10647, Taiwan R.O.C.
Tel: (886) 2 2741 4919 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

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.
Kortrijzer 4, 5721 VE Asten,
The Netherlands
Tel: (31) 493 681030 Fax: (31) 493 681039

GERMANY
GP BATTERY MARKETING (GERMANY) GMBH
Niederlorricker Str. 62, 40667 Meerbusch, Germany
Tel: (49) 2132 971504/5/6 Fax: (49) 2132 80145

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, U.K.
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

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

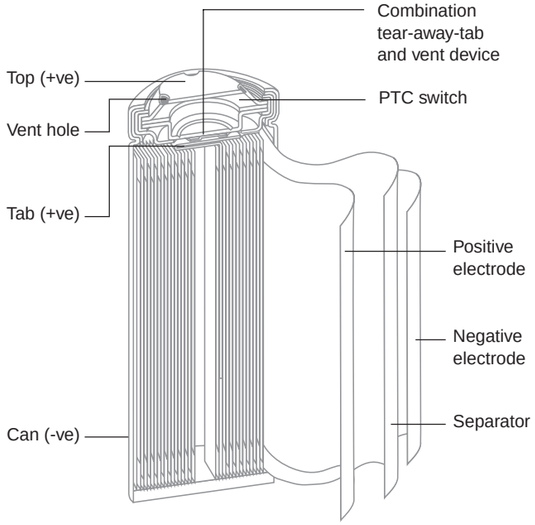
- **High Energy Density**
  Advanced technology provides ultra-high capacity performance for GP Li-ion batteries.
- **Variety of Sizes and Capacities**
  Our expanding list of models encompasses a wide range of battery sizes and capacities, making it convenient in various applications.
- **Wide Operating 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.

Major Applications

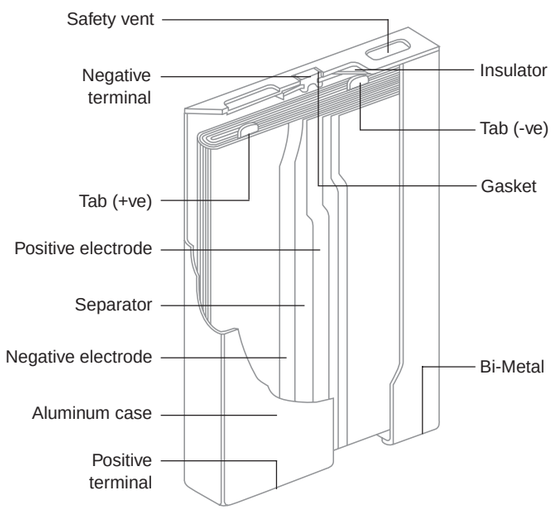
Notebook Computers, Cellular Phones, Digital Cameras, Camcorders, Video CD/DVD Players, MD Players, PDAs/Webpad, POS Terminals, Electronic Instruments, Communication Devices, etc.

Cell Construction

Cylindrical



Prismatic



Lithium Ion Rechargeable Batteries

Cylindrical Models

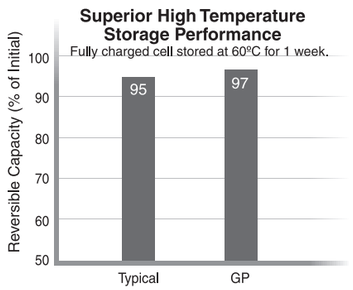
Specifications

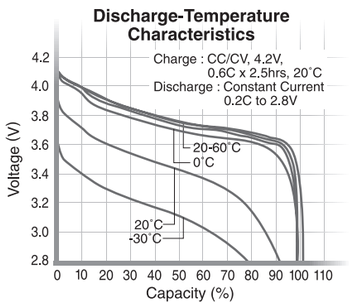
Model No.	Nominal Voltage (V)	Capacity (mAh) Typical	Capacity (mAh) Minimum	Dimension (mm) Diameter	Dimension (mm) Height	Weight (g)	Maximum Discharge Current (mA)	Maximum Charging Voltage (V)	Maximum Charging Current (mA)
GP1029L18*	3.7	180	170	10.5	29.0	5.5	360	4.2	180
GP1051L35*	3.7	350	330	10.5	51.0	10	700	4.2	350
GP1443L58*	3.7	580	550	14.0	43.0	16	870	4.2	580
GP1443L63*	3.7	630	600	14.0	43.0	16	945	4.2	630
GP1450L70*	3.7	700	650	14.0	50.0	19	1050	4.2	700
GP1465L100	3.7	1000	950	14.0	65.0	26	1500	4.2	1000
GP1750L110*	3.7	1100	1050	17.0	50.0	26	1650	4.2	1100
GP1767L160*	3.7	1600	1550	17.0	67.0	37	2400	4.2	1600
GP1850L130*	3.7	1300	1250	18.3	50.0	31	1950	4.2	1300
GP1850L140*	3.7	1400	1350	18.3	50.0	31	2100	4.2	1400
GP1865L200*	3.7	2000	1950	18.3	65.2	43	3000	4.2	2000
GP1865L210*	3.7	2100	2050	18.3	65.2	43	3150	4.2	2100
GP1865L220*	3.7	2200	2150	18.3	65.2	44	3300	4.2	2200

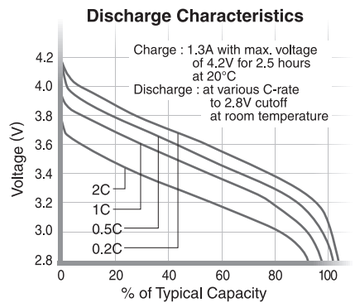
Typical Ambient Temperature : Charge : 0ºC to 45ºC / Discharge : -30ºC to 60ºC / Storage : -20ºC to 45ºC

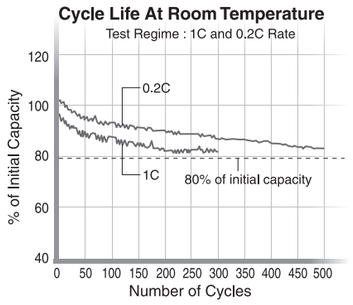
* UL recognized model

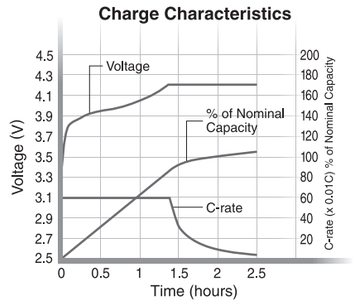
Performance Characteristics



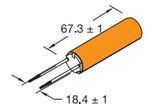
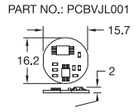
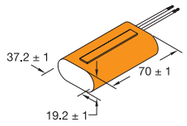
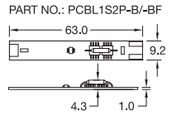
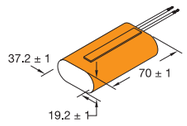
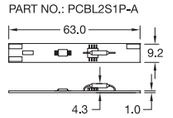
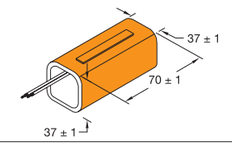
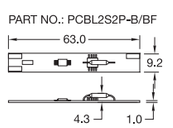
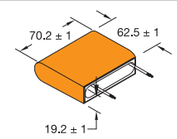
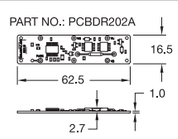
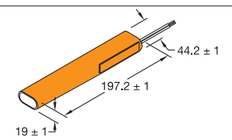
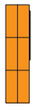
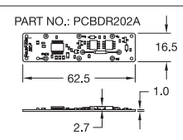
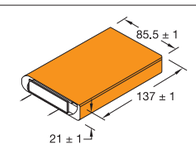
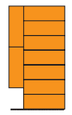
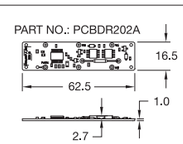
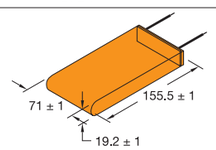
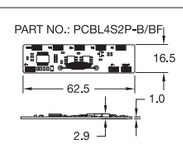








Configurations For soft packs of GP18650 Lithium Ion batteries.

Configuration Code	3-D View (unit in mm)	End View	Standard Protection Module (unit in mm)	Voltage (V)
1S1P				**3.7**
1S2P				**3.7**
2S1P				**7.4**
2S2P				**7.4**
3S1P				**11.1**
3S2P				**11.1**
3S3P				**11.1**
4S2P				**14.8**

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

Lithium Ion Rechargeable Batteries

Prismatic Models

Specifications

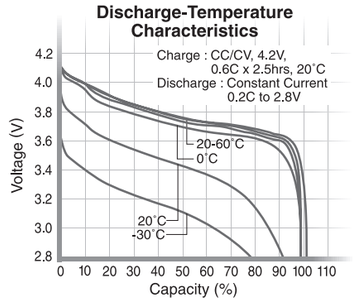
Model No.	Nominal Voltage (V)	Capacity (mAh) Typical	Capacity (mAh) Minimum	Dimension (mm)# Diameter	Dimension (mm)# Height	Weight (g)	Maximum Discharge Current (mA)	Maximum Charging Voltage (V)	Maximum Charging Current (mA)
GP363450L64*	3.7	640	610	3.6(T) x 34.0(W) x 50.0(H)		16	1280	4.2	640
GP413048L57*	3.7	570	540	4.1(T) x 30.0(W) x 48.0(H)		16	1140	4.2	570
GP413048L63*	3.7	630	600	4.1(T) x 30.0(W) x 48.0(H)		17	1260	4.2	630
GP413450L72*	3.7	720	690	4.1(T) x 34.0(W) x 50.0(H)		18	1440	4.2	720
GP493048L72R*	3.7	720	690	4.9(T) x 30.0(W) x 48.0(H)		18	1440	4.2	720
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)		15	1080	4.2	540
GP503048L72*	3.7	720	690	5.0(T) x 30.1(W) x 48.0(H)		18	1440	4.2	720
GP503436L60R*	3.7	600	570	5.0(T) x 34.0(W) x 36.1(H)		16	1200	4.2	600
GP503450L86R*	3.7	860	830	5.0(T) x 34.0(W) x 50.4(H)		21	1720	4.2	860
GP503449L90R	3.7	900	870	5.0(T) x 34.0(W) x 50.4(H)		21	1800	4.2	900
GP582231L37*	3.7	370	340	5.8(T) x 22.0(W) x 31.0(H)		11	740	4.2	370
GP582237L43*	3.7	430	400	5.8(T) x 22.0(W) x 37.1(H)		13	860	4.2	430
GP582248L52*	3.7	520	490	5.8(T) x 22.0(W) x 48.0(H)		16	1040	4.2	520
GP582248L57*	3.7	570	540	5.8(T) x 22.0(W) x 48.0(H)		16	1140	4.2	570
GP603450L95R*	3.7	950	920	6.0(T) x 34.1(W) x 50.0(H)		24	1900	4.2	950
GP603450L107R*	3.7	1070	1040	6.0(T) x 34.1(W) x 50.0(H)		24	2140	4.2	1070
GP603465L140	3.7	1400	1370	6.0(T) x 34.0(W) x 65.0(H)		33	2800	4.2	1400
GP623040L74*	3.7	740	710	6.2(T) x 30.0(W) x 40.0(H)		18	1480	4.2	740
GP623048L85*	3.7	850	820	6.2(T) x 30.0(W) x 48.0(H)		21	1700	4.2	850
GP623048L90*	3.7	900	870	6.2(T) x 30.0(W) x 48.0(H)		22	1800	4.2	900
GP813433L70*	3.7	700	670	8.1(T) x 34.0(W) x 33.0(H)		21	1400	4.2	700
GP813448L120*	3.7	1200	1170	8.1(T) x 34.0(W) x 48.0(H)		32	2400	4.2	1200
GP813448L130	3.7	1300	1270	8.1(T) x 34.0(W) x 48.0(H)		32	2600	4.2	1300
GP843042L93*	3.7	930	900	8.4(T) x 30.0(W) x 42.0(H)		25	1860	4.2	930
GP901940L63R*	3.7	630	600	9.2(T) x 19.1(W) x 40.0(H)		16	1260	4.2	630
GP901942L63R*	3.7	630	600	9.2(T) x 19.1(W) x 42.0(H)		17	1260	4.2	630
GP901942L70R*	3.7	700	670	9.2(T) x 19.1(W) x 42.0(H)		18	1400	4.2	700
GP901948L80R*	3.7	800	770	9.2(T) x 19.1(W) x 48.0(H)		20	1600	4.2	800
GP103448L155*	3.7	1550	1520	10.0(T) x 34.0(W) x 48.0(H)		39	3100	4.2	1550
GP103448L160	3.7	1600	1570	10.0(T) x 34.0(W) x 48.0(H)		40	3200	4.2	1600
GP103450L165R*	3.7	1650	1620	10.0(T) x 34.0(W) x 50.0(H)		41	3300	4.2	1650
GP103450L180R*	3.7	1800	1770	10.0(T) x 34.0(W) x 50.0(H)		41	3600	4.2	1800

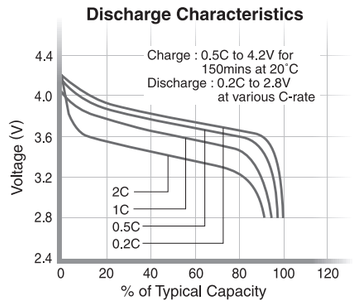
Typical Ambient Temperature : Charge : 0ºC to 45ºC / Discharge : -30ºC to 60ºC / Storage : -30ºC to 45ºC

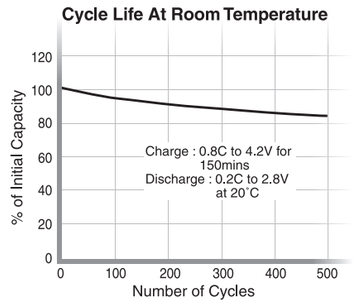
* UL recognized model

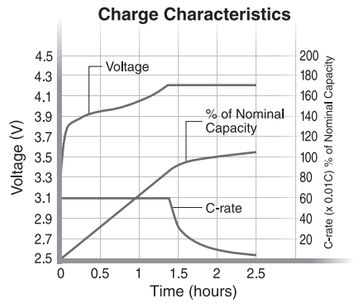
Dimension of bare cell before charging and cycling.

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.