

Keeper® II Lithium Thionyl Chloride (LiSOCl₂)

[MSDS](#)

EaglePicher provides an outstanding line of Lithium Thionyl Chloride cells and batteries, which are capable of providing power to a wide variety of applications. The exceptional reliability of the original Keeper® II cell is a result of the unique electrochemistry of the system, along with a design concept that requires military ruggedness. Keeper® II batteries provide reliable performance under several environmental conditions.

[Click on Part Number to view data sheet.](#)

Keeper® II Prismatic Cells and Batteries (LiSOCl ₂)						
Voltage (V)	Capacity (mAh)	Length (in)	Width (in)	Thickness (in)	Weight (g)	Part Number
3.5	350	0.60	0.65	0.25	4.0	LTC-3PN
3.5	350	0.65	0.25	0.60	4.0	LTC-3PN-S2
3.5	350	0.60	0.25	0.65	4.0	LTC-3PN-S4
3.5	750	1.20	0.70	0.35	9.0	LTC-7P
3.5	750	1.00	0.65	0.25	6.8	LTC-7PN
3.5	750	0.65	0.25	1.00	6.8	LTC-7PN-S4
3.5	750	1.00	0.25	0.65	6.8	LTC-7PN-S6
3.5	1500	1.50	1.20	0.35	19.0	LTC-7PMP
3.5	1500	1.54	1.22	0.45	25.0	LTC-7PMP-F-S2
7.0	750	1.50	1.20	0.35	19.0	LTC-7PMS
3.5	1200	1.00	0.54	0.54	11.4	LTC-12P
3.5	1600	1.44	0.55	0.55	16.0	LTC-16P
3.5	1600	1.86	0.66	0.66	25.0	LTC-16P-CO-F-S11
3.6	1500	1.20	0.90	0.28	14.0	LTC-15M-S3
3.6	1600	1.71	0.99	0.37	20.0	LTC-16M
3.6	1600	1.50	0.90	0.28	16.0	LTC-16M-S1
7.0	1600	1.92	1.03	0.68	45.0	LTC-16M-MS-S2
3.5	1600	1.90	0.70	0.72	30.0	LTC-16P-CO-F-S6
3.5	1600	1.90	0.70	0.72	30.0	LTC-16P-CO-F-S8
6.8	1600	1.90	1.30	0.70	53.0	LTC-16P-MS-F-S9
3.5	1600	1.90	1.30	0.70	53.0	LTC-16P-MP-F-S1

Section V - Reactivity Data

Stability	Unstable		Conditions to Avoid:
	Stable	XX	Vent rupture or explosion will release thionyl chloride

Incompatibility (Materials to Avoid)

SOC1₂ Water, humid air, alkalis, and temperature above 140°C (284°F)

Hazardous Decomposition or Byproducts

SOC1₂ In presence of water or humid air, hydrochloric acid & sulfur oxide.

Hazardous Polymerization	May Occur		Conditions to Avoid
	Will Not Occur	XX	

Section VI - Health Hazard Data

Routes(s) of Entry	Inhalation?	Skin?	Ingestion?
Eyes	Yes	Yes	Yes

Health Hazards (Acute and Chronic)

SOC1₂ - Will burn and irritate eyes & skin. Upper respiratory irritant. Continuous inhalation of fumes may cause lung damage.

Carcinogenicity	NTP?	IARC Monographs?	OSHA Regulated?
N/A			

Signs and Symptoms of Exposure

SOC1₂ - Eye and skin irritation, pungent odor and respiratory irritation.

Medical Conditions Generally Aggravated by Exposure

N/A

Emergency and First Aid Procedures

If free(SOC1₂) is present, evacuate areas and provide ventilation, wash exposed area with soda ash or sodium bicarbonate solution. Seek medical attention.**Section VII - Precautions for Safe Handling and Use**

Steps to Be Taken in Case Material is Released or Spilled

Avoid contact if vent rupture or explosion has occurred. Other wise protect from heat, short circuit of terminals, an accumulation of shorted batteries, which may cause dangerous elevated temperatures

Waste Disposal Method

Dispose of waste according to federal EPA, state and local regulations.

Precautions to be taken in Handling and Storing

Do not short circuit, heat above 125°C (257°F), recharge, disassemble, incinerate or expose to water.

Other Precautions

Section VIII - Control MeasuresRespiratory Protection (*Specific Type*)

Self-contained breathing apparatus

Ventilation	Local Exhaust	Specific
	Mechanical (<i>General</i>)	Other
N/A		

Protective Gloves

Neoprene

Eye Protection

Recommended

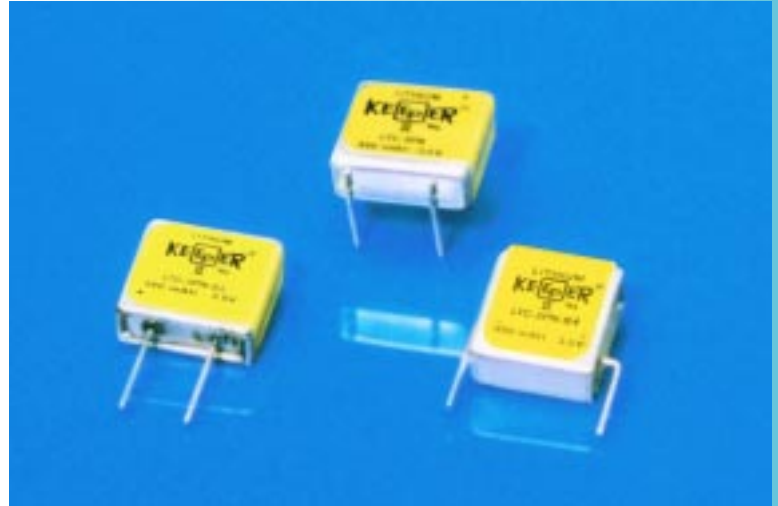
Other Protective Clothing or Equipment

N/A

Work/Hygienic Practices

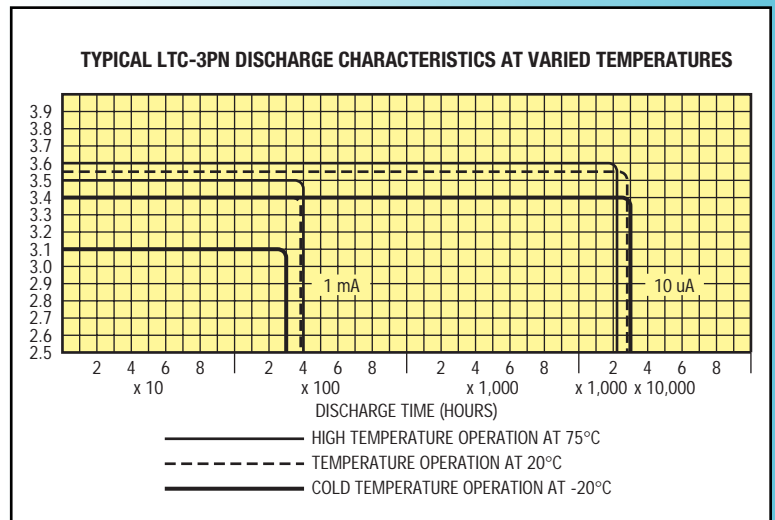
N/A

The LTC-3PN series is a perfect match for applications which have little space but need a reliable, high energy source. This cell is available in three (3) printed circuit board (PCB) mounting configurations, with the flexibility to be designed for any mounting geometry. With 350 mAh packed into 0.0975 in², these small power sources will provide the solution for your electronic packaging requirements.



LTC-3PN Product Features

- Manufactured in the USA.
- Low profile, prismatic design.
- Stainless steel construction provides corrosion resistance, hermetic seal and structural integrity.
- Years of low rate continuous use.
- Stand-by use with 80% capacity retention after 15 years at room temperature.
- Highly efficient utilization of valuable board space.
- Wave solderable (limit solder bath exposure to a maximum of 5 seconds).
- High energy density compared to other chemistries.
- No charging circuits required.
- Higher cell voltage allows for fewer cells and high reliability.
- Flat discharge characteristics provide optimum voltage regulation.
- Non-pressurized system allow for high temperature usage.
- Ship unrestricted.
- Underwriters Laboratories recognized component.



Do you have questions concerning:

- What size battery you need?
- What is passivation and its effects?
- What is the maximum rate of this cell?
- Any other technical question?

If so, call our Engineers at (417) 659-9635 for detailed technical information.

Part Number	Voltage	Capacity (mAh)	Length (in.)	Width (in.)	Thickness (in.)	Weight (g)
LTC-3PN	3.5	350	0.60	0.65	0.265	4.0
LTC-3PN-S2	3.5	350	0.65	0.265	0.60	4.0
LTC-3PN-S4	3.5	350	0.60	0.265	0.65	4.0
* LTC-3PN-SM-S1	3.5	350	0.60	0.65	0.265	4.0

* Surface Mount (Reflow soldering not acceptable)

Specifications LTC-3PN

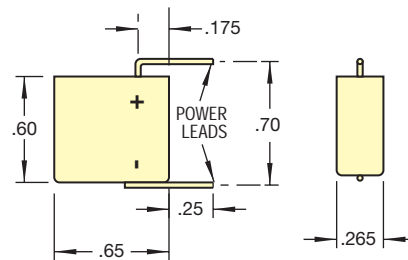
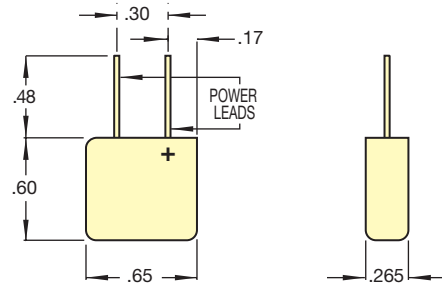
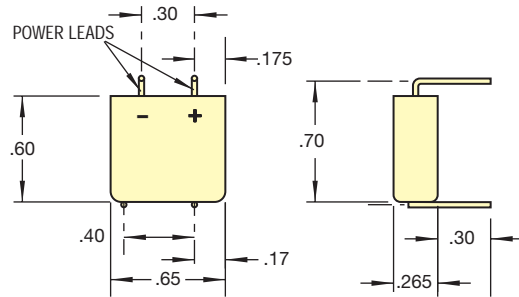
Nominal Open Circuit Voltage, 25°C 3.67 volts
 Nominal Working Voltage, 25°C..... 3.5 volts
 Nominal Capacity (350 hr. rate), 25°C 350 mAh
 Volume 0.103 cu. in.
 Weight 4.6 GMS
 Operating Temperature -40°C to +95°C
 Case Material: 304 Stainless Steel, Hermetically Sealed (case negative polarity)
 Terminal and Support Pins are .030" dia. (solder tinned)

Specifications LTC-3PN-S2

Nominal Open Circuit Voltage, 25°C 3.67 volts
 Nominal Working Voltage, 25°C..... 3.5 volts
 Nominal Capacity (350 hr. rate), 25°C 350 mAh
 Volume 0.103 cu. in.
 Weight 4.6 GMS
 Operating Temperature -40°C to +95°C
 Case Material: 304 Stainless Steel, Hermetically Sealed (case negative polarity)
 Terminal and Support Pins are .030" dia. (solder tinned)

Specifications LTC-3PN-S4

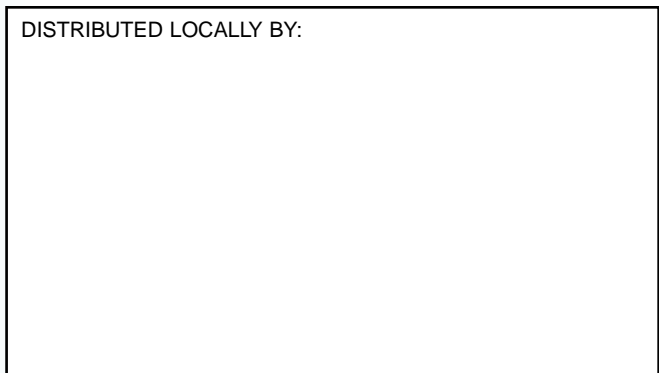
Nominal Open Circuit Voltage, 25°C 3.67 volts
 Nominal Working Voltage, 25°C..... 3.5 volts
 Nominal Capacity (350 hr. rate), 25°C 350 mAh
 Volume 0.103 cu. in.
 Weight 4.6 GMS
 Operating Temperature -40°C to +95°C
 Case Material: 304 Stainless Steel, Hermetically Sealed (case negative polarity)
 Terminal and Support Pins are .030" dia. (solder tinned)



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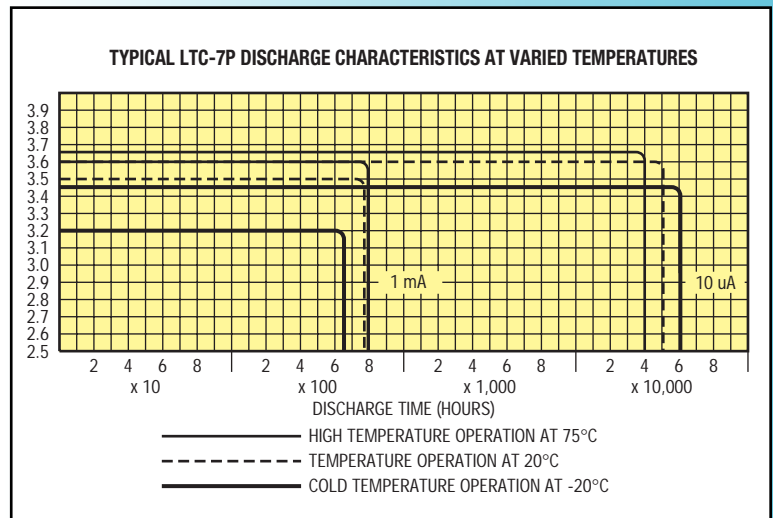


The LTC-7 module series was developed for those applications that require a high quality, ruggedly constructed, low profile battery configuration. Two (2) cell module designs are available, as either series connected (LTC-7PMS, 7.0 volts, 750 mAh) or parallel connected (LTC-7PMP, 3.5 volts, 1500 mAh) batteries. Additional features such as reverse charge protection can also be built in for added safety in sensitive applications.



LTC-7P Product Features

- Manufactured in the USA.
- Low profile, prismatic design.
- Stainless steel construction provides corrosion resistance, hermetic seal and structural integrity.
- Years of low rate continuous use.
- Stand-by use with 80% capacity retention after 15 years at room temperature.
- Highly efficient utilization of valuable board space.
- Wave solderable (limit solder bath exposure to a maximum of 5 seconds).
- High energy density compared to other chemistries.
- No charging circuits required.
- Higher cell voltage allows for fewer cells and high reliability.
- Flat discharge characteristics provide optimum voltage regulation.
- Non-pressurized system allow for high temperature usage.
- Ship unrestricted.
- Underwriters Laboratories recognized component.



Do you have questions concerning:

- What size battery you need?
- What is passivation and its effects?
- What is the maximum rate of this cell?
- Any other technical question?

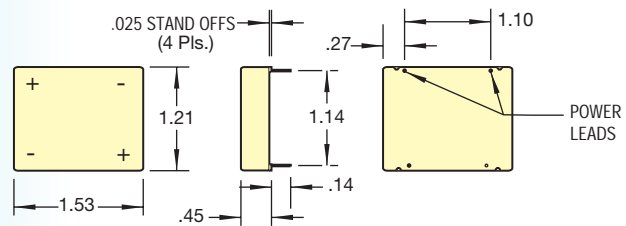
If so, call our Engineers at (417) 659-9635 for detailed technical information.

Part Number	Voltage	Capacity (mAh)	Length (in.)	Width (in.)	Thickness (in.)	Weight (g)
LTC-7P	3.5	750	1.20	0.70	0.33	9.0
* LTC-7PMP-F-S2	3.5	1500	1.54	1.22	0.45	25.0
LTC-7PMP	3.5	1500	1.50	1.20	0.35	19.0
LTC-7PMS	7.0	750	1.50	1.20	0.35	19.0

* Battery contains diode and resistor protection (IN5817 diode, 1.6k resistor). Working voltage rate dependent.

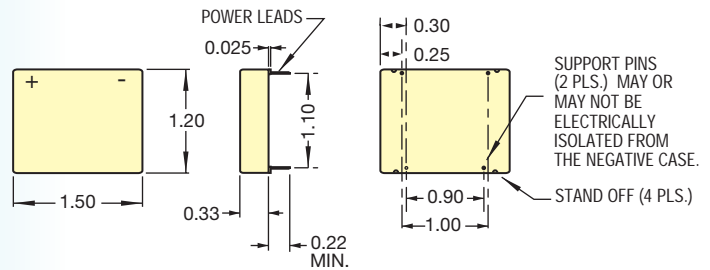
Specifications LTC-7PMP-F-S2

Nominal Open Circuit Voltage, 25°C 3.67 volts
 Nominal Working Voltage, 25°C 3.5 volts
 Nominal Capacity (350 hr. rate), 25°C 1500 mAh
 Volume796 cu. in.
 Weight 23.6 GMS
 Operating Temperature -40°C to +95°C
 Case Material: Ryton™ module
 Terminal and Support Pins are .030" dia. (solder tinned)



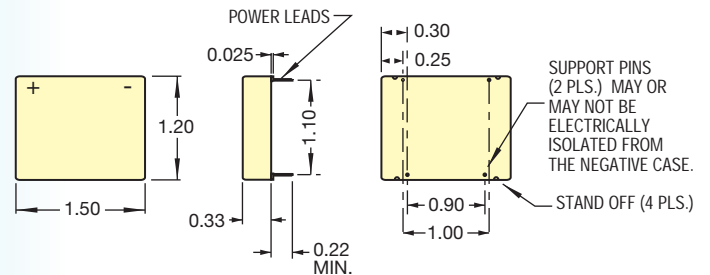
Specifications LTC-7PMP

Nominal Open Circuit Voltage, 25°C 3.67 volts
 Nominal Working Voltage, 25°C 3.5 volts
 Nominal Capacity (350 hr. rate), 25°C 1500 mAh
 Volume594 cu. in.
 Weight 20.0 GMS
 Operating Temperature -40°C to +95°C
 Case Material: Ryton™ module
 Terminal and Support Pins are .030" dia. (solder tinned)



Specifications LTC-7PMS

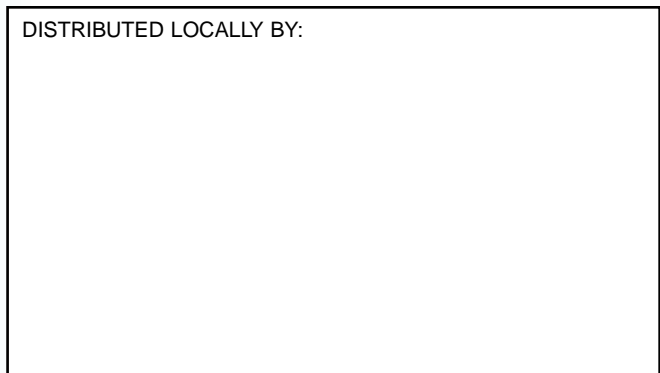
Nominal Open Circuit Voltage, 25°C 7.3 volts
 Nominal Working Voltage, 25°C 7.0 volts
 Nominal Capacity (350 hr. rate), 25°C 750 mAh
 Volume594 cu. in.
 Weight 19.0 GMS
 Operating Temperature -40°C to +95°C
 Case Material: Ryton™ module
 Terminal and Support Pins are .030" dia. (solder tinned)



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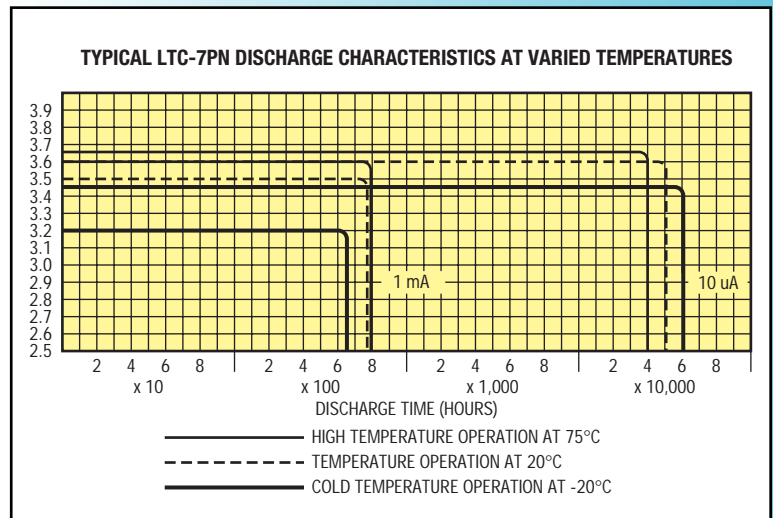


The LTC-7PN series was design specifically to be printed circuit board (PCB) compatible. With a low profile, prismatic shape, this battery is unique in the industry and a perfect match for space saving requirements. Available in 3 PCB mounting configurations, these cells provide high quality, high energy density, non-position sensitive solutions to your high density electronics power needs.



LTC-7PN Product Features

- Manufactured in the USA.
- Low profile, prismatic design.
- Stainless steel construction provides corrosion resistance, hermetic seal and structural integrity.
- Years of low rate continuous use.
- Stand-by use with 80% capacity retention after 15 years at room temperature.
- Highly efficient utilization of valuable board space.
- Wave solderable (limit solder bath exposure to a maximum of 5 seconds).
- High energy density compared to other chemistries.
- No charging circuits required.
- Higher cell voltage allows for fewer cells and high reliability.
- Flat discharge characteristics provide optimum voltage regulation.
- Non-pressurized system allow for high temperature usage.
- Ship unrestricted.
- Underwriters Laboratories recognized component.



Do you have questions concerning:

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- What is passivation and its effects?
- What is the maximum rate of this cell?
- Any other technical question?

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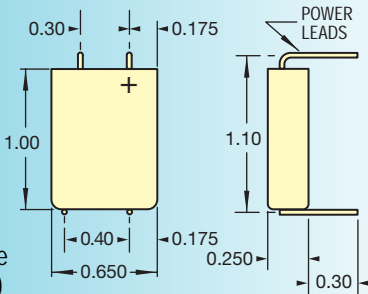
Part Number	Voltage	Capacity (mAh)	Length (in.)	Width (in.)	Thickness (in.)	Weight (g)
LTC-7PN	3.5	750	1.00	0.65	0.25	6.8
LTC-7PN-S2	3.5	750	1.00	0.65	0.25	6.8
LTC-7PN-S4	3.5	750	0.65	0.25	1.00	6.8
* LTC-7PN-S5	3.5	750	1.00	0.65	0.25	7.1
LTC-7PN-S6	3.5	750	1.00	0.25	0.65	6.8
** LTC-7PN-SM-S1	3.5	750	1.00	0.65	0.25	6.8

* Supplied with Molex connector

** Surface Mount (Reflow soldering not acceptable)

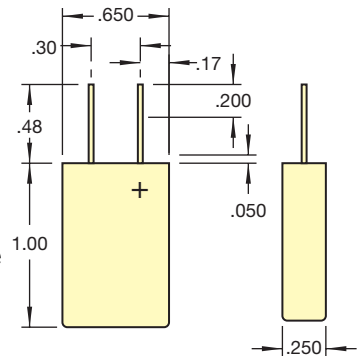
Specifications LTC-7PN

Nominal Open Circuit Voltage, 25°C 3.67 volts
 Nominal Working Voltage, 25°C 3.5 volts
 Nominal Capacity (350 hr. rate), 25°C 750 mAh
 Volume1625 cu. in.
 Weight 6.8 GMS
 Operating Temperature
 -40°C to +95°C
 Case Material:
 304 Stainless Steel,
 Hermetically Sealed
 (case negative polarity)
 Terminal and Support Pins are
 .030" dia. (solder tinned)



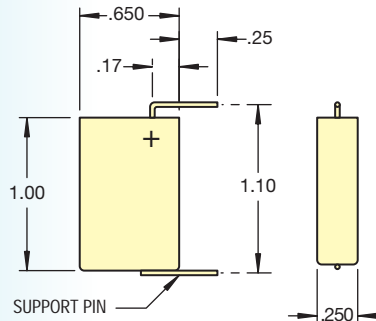
Specifications LTC-7PN-S4

Nominal Open Circuit Voltage, 25°C 3.67 volts
 Nominal Working Voltage, 25°C 3.5 volts
 Nominal Capacity (350 hr. rate), 25°C 750 mAh
 Volume1625 cu. in.
 Weight 6.8 GMS
 Operating Temperature
 -40°C to +95°C
 Case Material:
 304 Stainless Steel,
 Hermetically Sealed
 (case negative polarity)
 Terminal and Support Pins are
 .030" dia. (solder tinned)



Specifications LTC-7PN-S6

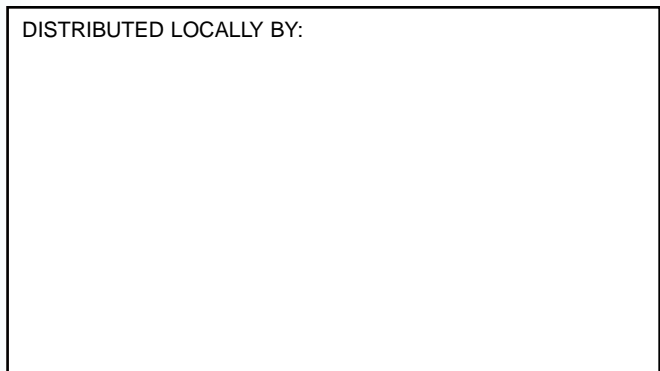
Nominal Open Circuit Voltage, 25°C 3.67 volts
 Nominal Working Voltage, 25°C 3.5 volts
 Nominal Capacity (350 hr. rate), 25°C 750 mAh
 Volume1625 cu. in.
 Weight 6.8 GMS
 Operating Temperature
 -40°C to +95°C
 Case Material: 304 Stainless Steel, Hermetically Sealed
 (case positive polarity)
 Terminal and Support Pins are .030" dia. (solder tinned)



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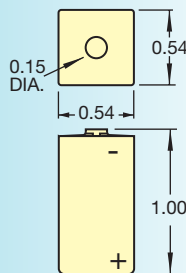


Part Number	Voltage	Capacity (mAh)	Length (in.)	Width (in.)	Thickness (in.)	Weight (g)
LTC-12P	3.5	1200	1.00	0.54	0.54	11.4
* LTC-12P-S3	3.5	1200	1.00	0.54	0.54	12.0
LTC-16P	3.5	1600	1.45	0.54	0.54	16.2
LTC-16P-CO-F-S11	3.5	1600	1.84	0.64	0.68	24.0
LTC-16P-MP-F-S1	3.5	3200	1.90	1.27	0.70	52.0
* LTC-16P-MS-F-S9	7.0	1600	1.90	1.27	0.66	42.0

* Supplied with Molex connector

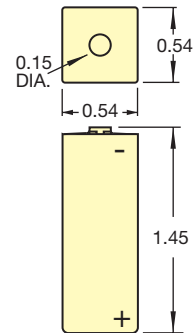
Specifications LTC-12P

Nominal Open Circuit Voltage, 25°C 3.67 volts
 Nominal Working Voltage, 25°C..... 3.5 volts
 Nominal Capacity (350 hr. rate), 25°C.....1200 mAh
 Volume293 cu. in.
 Weight11.4 GMS
 Operating Temperature..... -40°C to +95°C
 Case Material: 304 Stainless Steel,
 Hermetically Sealed
 (case positive polarity)
 Power Contacts: Button is negative
 Case is positive



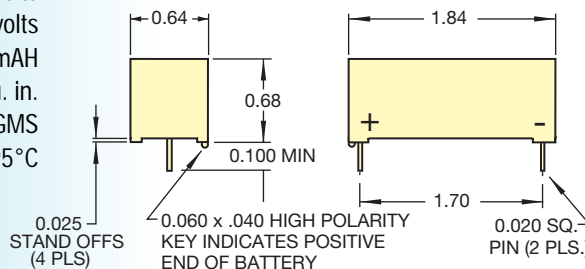
Specifications LTC-16P

Nominal Open Circuit Voltage, 25°C 3.67 volts
 Nominal Working Voltage, 25°C..... 3.5 volts
 Nominal Capacity (350 hr. rate), 25°C 1600 mAh
 Volume427 cu. in.
 Weight..... 16.2 GMS
 Operating Temperature..... -40°C to +95°C
 Case Material: 304 Stainless Steel,
 Hermetically Sealed
 (case positive polarity)
 Power Contacts: Button is negative
 Case is positive



Specifications LTC-16P-CO-F-S11

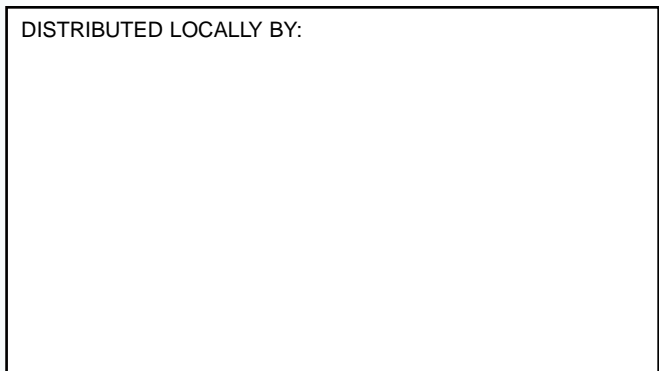
Nominal Open Circuit Voltage, 25°C 3.67 volts
 Nominal Working Voltage, 25°C..... 3.6 volts
 Nominal Capacity (350 hr. rate), 25°C.....1600 mAh
 Volume810 cu. in.
 Weight 24.0 GMS
 Operating Temperature -40°C to +95°C
 Case Material: Polyethylene
 Terminal and Support Pins are .030" dia. (solder tinned)



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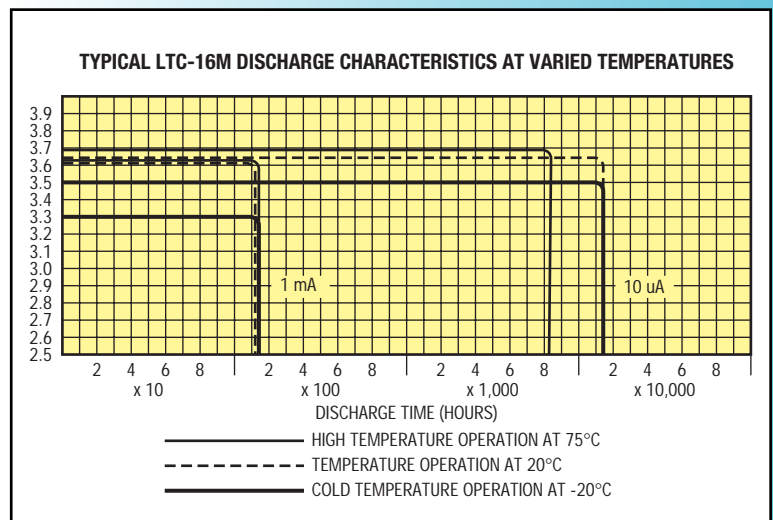


The powerful KEEPER II Magnum series includes the LTC-16M and LTC-15M series cells. These cells provide years of low-power drain, stand-by use or those demanding industrial, commercial and military applications where reliability is the primary concern. The low profile prismatic designs of the 15M and 16M cells, allow maximum board space utilization and are available with polarized PCB mount pins. Also available are battery configurations offering either high voltage (7.0 volts) or high capacity (3200 mAh) output. With these characteristics the KEEPER II Magnum series exhibits the same high quality performance that the entire KEEPER II line has demonstrated for over 20 years.



LTC-15M & 16M Product Features

- Manufactured in the USA.
- Low profile, prismatic design.
- Stainless steel construction provides corrosion resistance, hermetic seal and structural integrity.
- Years of low rate continuous use.
- Stand-by use with 80% capacity retention after 15 years at room temperature.
- Highly efficient utilization of valuable board space.
- Wave solderable (limit solder bath exposure to a maximum of 5 seconds).
- High energy density compared to other chemistries.
- No charging circuits required.
- Higher cell voltage allows for fewer cells and high reliability.
- Flat discharge characteristics provide optimum voltage regulation.
- Non-pressurized system allow for high temperature usage.
- Ship unrestricted.
- Underwriters Laboratories recognized component.



Do you have questions concerning:

- What size battery you need?
- What is passivation and its effects?
- What is the maximum rate of this cell?
- Any other technical question?

If so, call our Engineers at (417) 659-9635 for detailed technical information.

Part Number	Voltage	Capacity (mAh)	Length (in.)	Width (in.)	Thickness (in.)	Weight (g)
LTC-15M-S3	3.5	1500	1.20	0.90	0.28	14.0
LTC-16M	3.5	1600	1.72	1.00	0.39	19.7
LTC-16M-S1	3.5	1600	0.90	0.27	1.50	16.0
* LTC-16M-MP-S2	3.5	3200	1.59	0.98	0.68	33.0
LTC-16M-MS-S2	7.0	1600	1.74	1.02	0.68	40.0
LTC-16M-SM-S1	3.5	1600	1.50	0.90	0.27	18.0

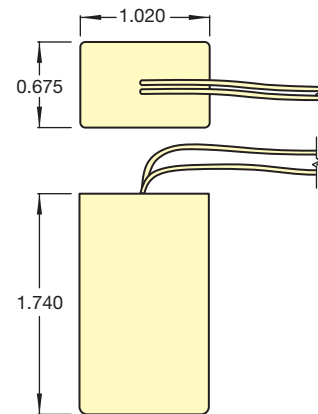
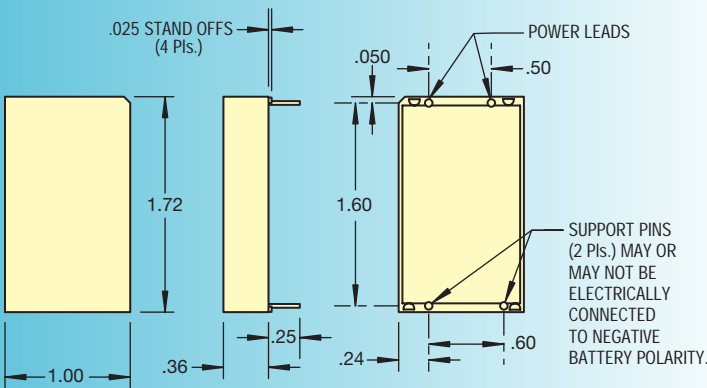
* Supplied with Molex connector

Specifications LTC-16M

Nominal Open Circuit Voltage, 25°C 3.67 volts
 Nominal Working Voltage, 25°C..... 3.5 volts
 Nominal Capacity (350 hr. rate), 25°C 1600 mAh
 Volume626 cu. in.
 Weight 19.7 GMS
 Operating Temperature -40°C to +95°C
 Case Material: Ryton™ module
 Terminal and Support Pins are .030" dia. (solder tinned)

Specifications LTC-16M-MS-S2

Nominal Open Circuit Voltage, 25°C 7.3 volts
 Nominal Working Voltage, 25°C..... 7.0 volts
 Nominal Capacity (350 hr. rate), 25°C 1600 mAh
 Volume 1.20 cu. in.
 Weight 40.0 GMS
 Operating Temperature -40°C to +95°C
 Case Material: Noryl



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