

EaglePicher Technologies, LLC Commercial **Power** P.O. Box 47 Joplin, MO 64802 (417) 623-8000 inquiry.**keeper**@eaglepicher.com

# Keeper® II Lithium Thionyl Chloride (LiSOCI<sub>2</sub>)

# **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<sup>®</sup> II cell is a result of the unique electrochemistry of the system, along with a design concept that requires military ruggedness. Keeper<sup>®</sup> II batteries provide reliable performance under several environmental conditions.

Click on Part Number to view data sheet.

Keeper®	II Prismatic	Cells and I	Batteries (Li	SOCI <sub>2</sub> )		
Voltage	Capacity	Length	Width	Thickness	Weight	Part
(V)	(mAh)	(in)	(in)	(in)	(g)	Number
3.5	350	0.60	0.65	0.25	4.0	<u>LTC-3PN</u>
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	<u>LTC-7P</u>
3.5	750	1.00	0.65	0.25	6.8	<u>LTC-7PN</u>
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	<u>LTC-7PMP</u>
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	<u>LTC-7PMS</u>
3.5	1200	1.00	0.54	0.54	11.4	<u>LTC-12P</u>
3.5	1600	1.44	0.55	0.55	16.0	<u>LTC-16P</u>
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	<u>LTC-15M-S3</u>
3.6	1600	1.71	0.99	0.37	20.0	<u>LTC-16M</u>
3.6	1600	1.50	0.90	0.28	16.0	<u>LTC-16M-S1</u>
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

# **Material Safety Data Sheet**

May be used to comply with

OSHA's Hazard Communication Standard. 29 CFR 1910 1200 Standard must be

# U.S. Department of Labor

Occupational Safety and Health Administration (Non-Mandatory Form)

Form Approved

	-t-				
Identity (Ac Hood on Lobel and List)	consulted for specific requirements.		OMB No. 1218-0072		
Identity (As Used on Label and List)		Note: Blank spaces are not permitted. If any item is not applicable, or			
KEEPER II/Lithium/Thionyl Chloride Battery		no information is available, the space must be marked to indicate that			
Section I					
Manufacturer's Name		Emergency Telephone Number			
Eagle-Picher Technologies, LLC		417-776-2256 800-424-9	300 (CHEMT	ΓREC)	
Address (Number, Street, City State, and	l Zip Code)	Telephone Number for Information		·	
P.O. Box 130		417-776-2256			
14212 Bethel Road		Date Prepared			
Seneca, MO 64865		1-Jul-98			
·		Signature of Preparer (optional)			
Section II - Hazardous Ingredi	ents/Identity Infor	nation			
Hazardous Components (Specific Chemical Ide	entity, Common Name(s))	OSHA PEL ACGIH TLV Other Limit:	s Recommended	% (optional)	
Lithium metal Cas #7439-93-2	(-1)	N/A-reactive alkali metal		(	
Thionyl chloride (SOC1 <sub>2</sub> ) Cas #007719-0	9-7	1/0 ppm 5/0 ppm			
	•	ло ррш			
_					
Section III. Physical/Chamica	I Charactariation				
Section III - Physical/Chemica	I Characteristics				
Section III - Physical/Chemica Boiling Point	I Characteristics	Specific Gravity (H₂O=1)		N/A	
Boiling Point				N/A	
Boiling Point	N/A	Specific Gravity (H <sub>2</sub> O=1)  Melting Point			
Boiling Point				N/A N/A	
Boiling Point Vapor Pressure (mm Hg.)	N/A N/A			N/A	
	N/A	Melting Point			
Boiling Point  Vapor Pressure (mm Hg.)  Vapor Density (Air=1)  Solubility in Water	N/A N/A	Melting Point		N/A	
Boiling Point  Vapor Pressure (mm Hg.)  Vapor Density (Air=1)	N/A N/A	Melting Point		N/A	
Boiling Point  Vapor Pressure (mm Hg.)  Vapor Density (Air=1)  Solubility in Water	N/A N/A	Melting Point		N/A	
Boiling Point  Vapor Pressure (mm Hg.)  Vapor Density (Air=1)  Solubility in Water  N/A	N/A N/A	Melting Point		N/A	
Boiling Point  Vapor Pressure (mm Hg.)  Vapor Density (Air=1)  Solubility in Water  N/A  Appearance in Odor	N/A N/A N/A	Melting Point		N/A	
Boiling Point  Vapor Pressure (mm Hg.)  Vapor Density (Air=1)  Solubility in Water  N/A  Appearance in Odor  N/A  Section IV - Fire and Explosio	N/A N/A N/A	Melting Point	LEL	N/A	
Boiling Point  Vapor Pressure (mm Hg.)  Vapor Density (Air=1)  Solubility in Water  N/A  Appearance in Odor  N/A  Section IV - Fire and Explosio  Flash Point (Method Used)	N/A N/A N/A	Melting Point  Evaporation Rate (Butyl Acetate=1)	LEL	N/A N/A	
Boiling Point  Vapor Pressure (mm Hg.)  Vapor Density (Air=1)  Solubility in Water  N/A  Appearance in Odor  N/A  Section IV - Fire and Explosio  Flash Point (Method Used)  N/A	N/A N/A N/A	Melting Point  Evaporation Rate (Butyl Acetate=1)	LEL	N/A N/A	
Boiling Point  Vapor Pressure (mm Hg.)  Vapor Density (Air=1)  Solubility in Water N/A  Appearance in Odor N/A  Section IV - Fire and Explosio  Flash Point (Method Used) N/A  Extinguishing Media	N/A N/A N/A n Hazard Data	Melting Point  Evaporation Rate (Butyl Acetate=1)  Flammable Limits	LEL	N/A N/A	
Boiling Point  Vapor Pressure (mm Hg.)  Vapor Density (Air=1)  Solubility in Water N/A  Appearance in Odor N/A  Section IV - Fire and Explosio  Flash Point (Method Used) N/A  Extinguishing Media Do not use water. Use dry che	N/A N/A N/A n Hazard Data	Melting Point  Evaporation Rate (Butyl Acetate=1)  Flammable Limits	LEL	N/A N/A	
Boiling Point  Vapor Pressure (mm Hg.)  Vapor Density (Air=1)  Solubility in Water  N/A  Appearance in Odor  N/A  Section IV - Fire and Explosio  Flash Point (Method Used)  N/A  Extinguishing Media  Do not use water. Use dry che  Special Fire Fighting Procedures	N/A N/A N/A n Hazard Data emical, soda ash, sa	Melting Point  Evaporation Rate (Butyl Acetate=1)  Flammable Limits	LEL	N/A N/A	
Boiling Point  Vapor Pressure (mm Hg.)  Vapor Density (Air=1)  Solubility in Water  N/A  Appearance in Odor  N/A  Section IV - Fire and Explosio  Flash Point (Method Used)  N/A  Extinguishing Media  Do not use water. Use dry che  Special Fire Fighting Procedures  Use self contained breathing a	N/A N/A N/A n Hazard Data emical, soda ash, sa	Melting Point  Evaporation Rate (Butyl Acetate=1)  Flammable Limits	LEL	N/A N/A	
Boiling Point  Vapor Pressure (mm Hg.)  Vapor Density (Air=1)  Solubility in Water  N/A  Appearance in Odor  N/A  Section IV - Fire and Explosio  Flash Point (Method Used)  N/A  Extinguishing Media  Do not use water. Use dry che  Special Fire Fighting Procedures  Use self contained breathing a  Unusual Fire and Explosion Hazards	N/A N/A N/A N/A  n Hazard Data  emical, soda ash, sa apparatus and full p	Melting Point  Evaporation Rate (Butyl Acetate=1)  Flammable Limits  and.  rotective equipment.		N/A N/A	
Boiling Point  Vapor Pressure (mm Hg.)  Vapor Density (Air=1)  Solubility in Water  N/A  Appearance in Odor  N/A  Section IV - Fire and Explosio  Flash Point (Method Used)  N/A  Extinguishing Media  Do not use water. Use dry che  Special Fire Fighting Procedures  Use self contained breathing a  Unusual Fire and Explosion Hazards	N/A N/A N/A N/A n Hazard Data emical, soda ash, sa apparatus and full p	Melting Point  Evaporation Rate (Butyl Acetate=1)  Flammable Limits  and.  rotective equipment.  (257°F), incinerate or expose		N/A N/A	

Section V - Reacti	vity Data					
Stability	Unstable		Conditions	to Avoid:		
	Stable	XX	Vent rupt	ure or explosion will release thionyl chloride		
Incompatibility (Materials	s to Avoid)	•		·		
SOC1 <sub>2</sub> Water, h	SOC1 <sub>2</sub> Water, humid air, alkalies, and temperature above 140°C (284°F)					
Hazardous Decompositi	on or Byproducts	•		,		
·	nce of water or humid	air. hvdrod	chloric acid	& sulfur oxide.		
	May Occur	,,	Conditions			
Hazardous Polymerization	Will Not Occur	XX	Conditions	to / Word		
Section VI - Healtl		, , ,				
Routes(s) of Entry	Inhalation?	Sk	in?	Ingestion?		
Eyes	Yes		es	Yes		
Health Hazards (Acute a		•		. 00		
· ·		kin Unner	resniratory	irritant. Continuous inhalation of fumes		
may cause lung of		кит. Оррст	reopiratory	intant. Continuous initialation of fames		
may cause lung t	damaye.					
Carcinogenicity	NTP?	IAPC Mo	nographs?	OSHA Regulated?		
N/A	IVII :	IAI (O IVIO	nograpns:	OOT IA Negulated:		
Signs and Symptoms of	Exposure					
	I skin irritation, punger	nt odor and	l resnirator	/ irritation		
OOO 12 - Lyc and	i skiii iiritation, pangei	it oddi dila	respirator	y initiation.		
Modical Conditions Con	erally Aggravated by Expos	uro				
N/A	erally Aggravated by Expos	ule				
Emergency and First Aid	1 Procedures					
		oo and pro	vido vontilo	ation, wash exposed area with soda ash		
				nion, wash exposed area with soda ash		
or sodium bicarbo	onate solution. Seek r	nedicai atte	ention.			
Coeffor VII Dreed	outions for Cofe Han	اممر مما	llaa			
	autions for Safe Han		USe			
	se Material is Released or	•	urrad Otha	ar wise protect from boot		
				er wise protect from heat,		
		ion of snor	ted batterie	s, which may cause dangerous		
elevated tempera	atures					
Waste Disposal Method	according to fodoral	CDA state	and local r	ogulationa		
Dispose of waste	according to federal	EPA, State	and local i	egulations.		
Descritions to be talen	in Handling and Otaving					
Precautions to be taken		(257°E) ro	ohargo die	sassemble, incinerate or		
expose to water.	iii, iieai above 125 C	(231 1), 16	criarge, uis	sassemble, inclinerate of		
Other Precautions						
Other Fredautions						
Section VIII - Cont	trol Moseuroe					
Respiratory Protection &	d breathing apparatus					
Ventilation	Local Exhaust	<b>)</b>		Chacifia		
venillation	Local Exhaust			Specific		
	Mechanical (General)			Other		
N/A	Mechanical (General)			Ouici		
Protective Gloves	l		Eve Protoc	ation .		
	,					
			Recon			
Neoprene	a or Equipment		Recon	nmended		
Neoprene Other Protective Clothin	g or Equipment		Recon			
Neoprene			Recon			

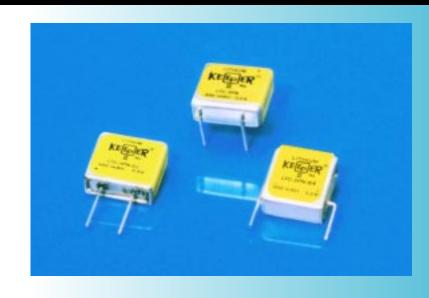




# LTC-3PN

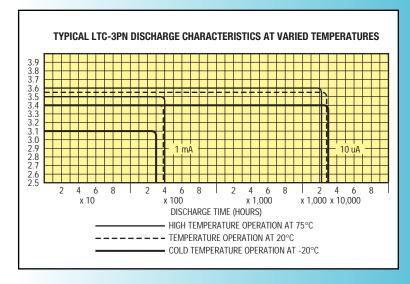
# **Lithium-Thionyl Chloride Batteries**

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 in<sup>2</sup>, 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?





# LTC-3PN

# Lithium-Thionyl Chloride Batteries

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

<sup>\*</sup> 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

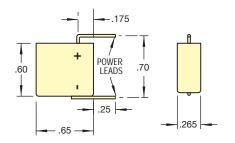
Case Material: 304 Stainless Steel, Hermetically Sealed (case negative polarity) Terminal and Support Pins are .030" dia. (solder tinned)

# **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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# **WE CAN DESIGN TO FIT ANY APPLICATION.**

Our team of engineers can design any pin configuration required to fit your specialized application. If you don't see a battery configuration you need here, call us and we will begin working on a EPT part number just for you.



The specifications on this sheet may be changed by Eagle-Picher Technologies, LLC, without notice.

KEEPER I Lithium-Thionyl Chloride Batteries

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DIST	KIROTE	D LOC	ALLY	BY





# LTC-7P

# **Lithium-Thionyl Chloride Batteries**

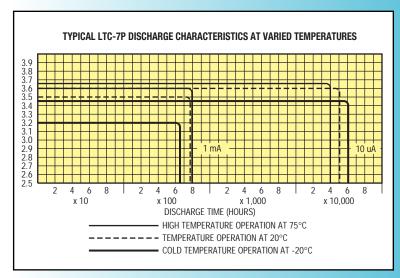
The LTC-7 module series was developed for those applications that require a high quality, ruggedly constructed, low profile battery configuration.

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?





# LTC-7P

POWER

ISOLATED FROM THE NEGATIVE CASE.

STAND OFF (4 PLS.)

**LEADS** 

# **Lithium-Thionyl Chloride Batteries**

.025 STAND OFFS (4 Pls.)

1.21

1.50

0.33

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

<sup>\*</sup> 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
Volume	796 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
Volume	594 cu. in.
Weight	20.0 GMS
Operating Temperature	-40°C to +95°C
O MILLIDI TM II	

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
Volume	594 cu. in.
Weight	19.0 GMS
Operating Temperature	40°C to +95°C
Casa Material: PutonTM modulo	

Case Material: Ryton™ module

Terminal and Support Pins are .030" dia. (solder tinned)

#### 0.025 0.25 SUPPORT PINS (2 PLS.) MAY OR MAY NÓT BE 1.20 **ELECTRICALLY** ISOLATED FROM THE NEGATIVE CASE STAND OFF (4 PLS.) 0.90 0.33 <del>-</del>-1.00 0.22 MIN. POWER LEADS **⊸** ► 0.30 0.025-الما 0.25 إلما SUPPORT PINS (2 PLS.) MAY OR MAY NOT BE 1.20 ELECTRICALLY

• 0.30

0.90

-1.00

1.14

POWER LEADS

#### **WE CAN DESIGN TO FIT ANY APPLICATION.**

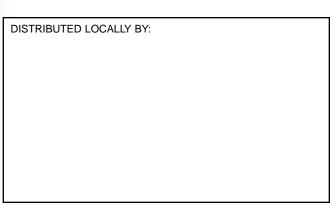
Our team of engineers can design any pin configuration required to fit your specialized application. If you don't see a battery configuration you need here, call us and we will begin working on a EPT part number just for you.



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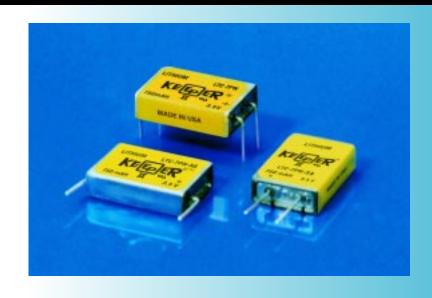




# LTC-7PN

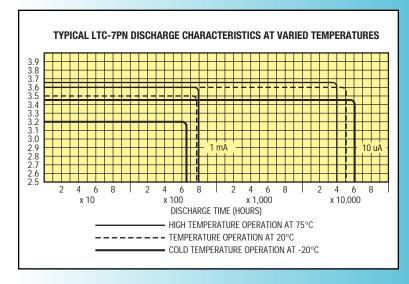
# **Lithium-Thionyl Chloride Batteries**

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.



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





# LTC-7PN

# **Lithium-Thionyl Chloride Batteries**

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), 29	5°C 750 mAH
Volume	30 O.175 POWER LEADS
Operating Temperature -40°C to +95°C	+ 7
Case Material: 1.00 304 Stainless Steel, Hermetically Sealed	1.10
(case negative polarity) Terminal and Support Pins are .030" dia. (solder tinned)	0.40 - 0.175 0.250 - 0.30 -

# **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

Volume 1625 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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e-mail: inquiry.keeper@eaglepicher.com • Web Site: www.eaglepicher.com

# **Specifications LTC-7PN-S4**

opcomoations Lib-71 N-54
Nominal Open Circuit Voltage, 25°C 3.67 volts
Nominal Working Voltage, 25°C
Nominal Capacity (350 hr. rate), 25°C 750 mAH
Volume
Weight 6.8 GMS .30
Operating Temperature
40°C to +95°C
Case Material:
304 Stainless Steel,
Hermetically Sealed
(case negative polarity)
Terminal and Support Pins are 1.00
.030" dia. (solder tinned)
650
.17
<u> </u>
1.10



SUPPORT PIN



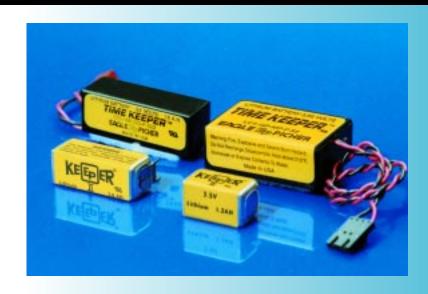


# LTC-12P & 16P

# Lithium-Thionyl Chloride Batteries

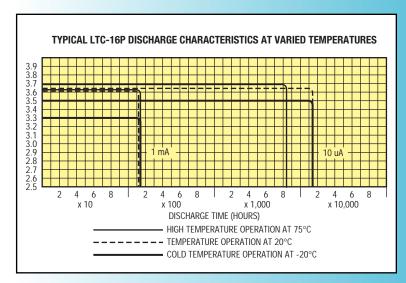
Eagle Picher's TIMEKEEPER™ computer memory backup batteries and square prismatic batteries are designed to give long life to low current drain applications.

A UL recognized component, these designs will meet and exceed the requirements of the memory backup industry. With added features available such as reverse current protection and Molex connectors, our long shelf life batteries will provide the power you need.



#### LTC-12P & 16P Product Features

- Manufactured in the USA.
- 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.
- 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?





# LTC-12P & 16P

# **Lithium-Thionyl Chloride Batteries**

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	1 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

<sup>\*</sup> Supplied with Molex connector

# Specifications LTC-12P

Nominal Capacity (350 hr. rate), 25°C ......1200 mAH Weight ......11.4 GMS 0.54 Operating Temperature..... -40°C to +95°C Case Material: 304 Stainless Steel, - 0 54 -Hermetically Sealed (case positive polarity) Power Contacts: Button is negative Case is positive

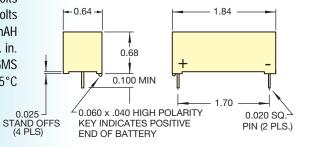
# 1.00

#### Specifications LTC-16P-CO-F-S11

Nominal Capacity (350 hr. rate), 25°C ......1600 mAH Weight ...... 24.0 GMS Operating Temperature ......-40°C to +95°C Case Material: Polyethylene Terminal and Support Pins are .030" dia. (solder tinned)

# **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 Weight ...... 16.2 GMS Operating Temperature..... -40°C to +95°C Case Material: 304 Stainless Steel, -0.54 Hermetically Sealed (case positive polarity) Power Contacts: Button is negative Case is positive 1.45



#### WE CAN DESIGN TO FIT ANY APPLICATION.

Our team of engineers can design any pin configuration required to fit your specialized application. If you don't see a battery configuration you need here, call us and we will begin working on a EPT part number just for you.



The specifications on this sheet may be changed by Eagle-Picher Technologies, LLC, without notice.

KEEPER I Lithium-Thionyl Chloride Batteries

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# LTC-15M & 16M

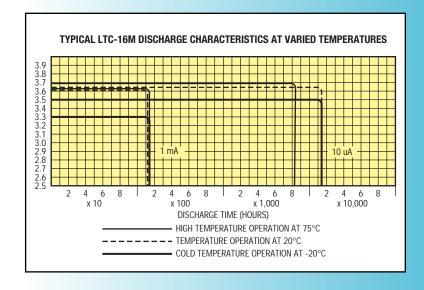
# Lithium-Thionyl Chloride Batteries

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.

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#### 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?





# LTC-15M & 16M

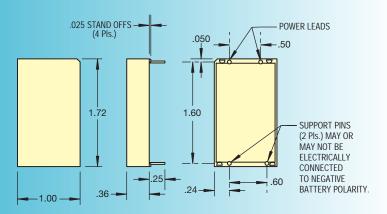
# **Lithium-Thionyl Chloride Batteries**

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

<sup>\*</sup> Supplied with Molex connector

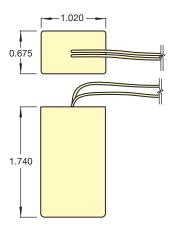
# **Specifications LTC-16M**

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	



#### **WE CAN DESIGN TO FIT ANY APPLICATION.**

Our team of engineers can design any pin configuration required to fit your specialized application. If you don't see a battery configuration you need here, call us and we will begin working on a EPT part number just for you.



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