Larson Electronics LLC
9419 E US HWY 175, Kemp, TX 75143
Phone: 800.369.6671

www.LarsonElectronics.com
Email: sales@LarsonElectronics.com
Fax: 903.498.3364

BTT-LON-207WH-SMBUS

Rechargeable Lithium-ion Battery - Military Grade Construction - Dual LCD Display - SMBus Interface

Product ID: 149186



Larson Electronics LLC manufactures a wide variety of products, including custom built to spec designs. The pictures displayed for this unit are a general representation of form factor for the product line and may not accurately represent this exact configuration in every detail due to custom builds and changes between similar products in our standard catalog. The specifics for this configuration are listed in the specification table and supporting documentation (CAD files, Dimensional Drawing, Name Plate Diagram, Wiring Diagram, etc.). This means that specific details (receptacles, plugs, wires, connections, mounting brackets, external finishes, etc.) may not be accurately represented in images vs specifications. Please review specifications and do not order based solely on images.

BTT-LON-207WH-SMBUS Battery

Battery Type: Lithium-ion
Voltage Range: 30V Mode: 24.0 to 33.6V; 15V Mode: 12.0 to 16.8V
Average Voltage: 30V Mode: 28.8V; 15V Mode: 14.4V
Capacity: 30V Mode: 7.2Ah @ 0.5A @ 23°C; 15V Mode: 14.4Ah @ 1.0A @ 23°C
Max Discharge: 30V Mode: 6.0A continuous; 15V Mode: 12.0A continuous
Max Pulse Discharge: 30V Mode: 18.0A for 5 seconds; 15V Mode: 36.0A for 5 seconds
Energy: 207Wh
Energy Discharge: 144Wh/kg, 230Wh/l
Weight: 3.17 lbs
Cycle Life: > 300 cycles @ C/5 to 80% of initial capacity @ 100% depth of discharge
Operating & Storage Temp: -32°C to 60°C
Self-Discharge: < 5% per month
Housing Material: Hard plastic, black
Self-Discharge: < 5% per month

Ratings/Approvals

Meets MIL-PRF-32052/1
Rugged, military tough case construction
Flexible output voltage
State-of-Charge display
High energy density
Implements SMBus v1.1 smart battery technology

Special Orders- Requirements

Contact us for special requirements

Toll Free: 1-800-369-6671
Intl: 1-903-270-1187
E-mail: sales@larsonelectronics.com

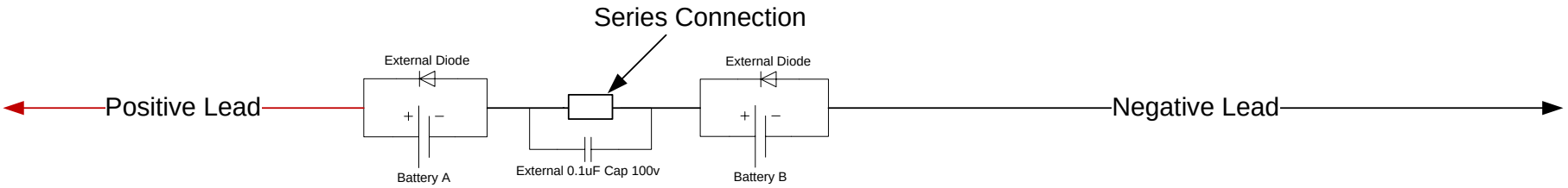
The BTT-LON-207WH-SMBUS Rechargeable Lithium-ion Battery is designed to be used in a wide array of portable applications where

military-grade power is required. This rechargeable battery is used in a wide range of military applications including robotics, AUVs, UUVs and military communications

The BTT-LON-207WH-SMBUS is a heavy duty lithium-ion battery with military grade construction for deep cycle use. This durable li-ion battery contains two independent battery sections which can be connected in a series or parallel. In 30V series mode, the battery operates between 33.6V and 24.0V (28.8V average) and delivers 7.2Ah. In 15V parallel mode, the battery operates between 16.8V and 12.0V (14.4V average) and delivers 14.4Ah.

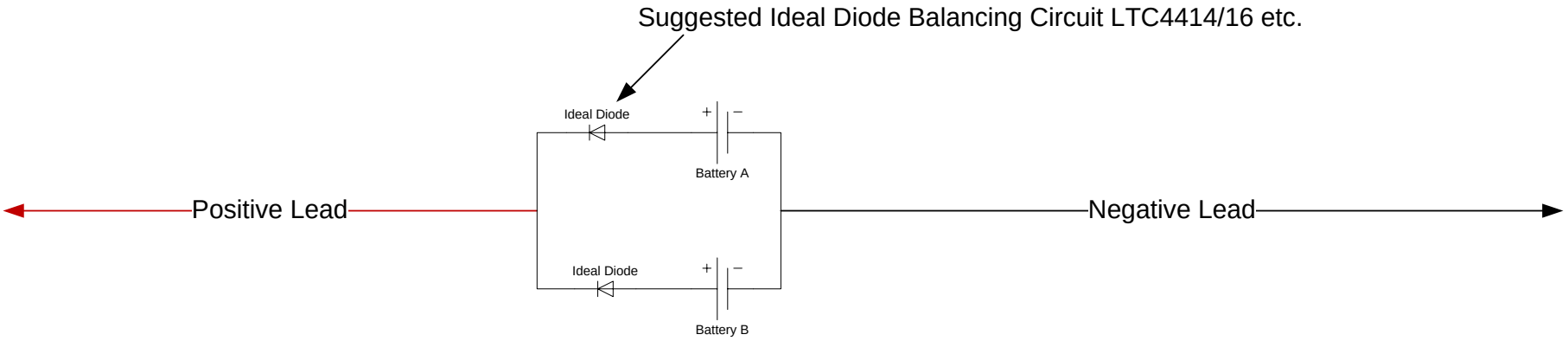
The BTT-LON-207WH-SMBUS features dual LCD displays which indicate the state of charge for each section. This smart circuit technology allows compatible devices and chargers to communicate with the battery via its SMBus v1.1 compliant interface.

Suggested Series Connection Schematic



External Diodes help with reliability and robustness of the MOSFET elements during turn on/off. External Capacitor is only required if the series connection can be disconnected during high current operation (i.e. series connection made with breaker, fuse, etc.) External capacitor should be 2x expected maximum voltage of the series stack.

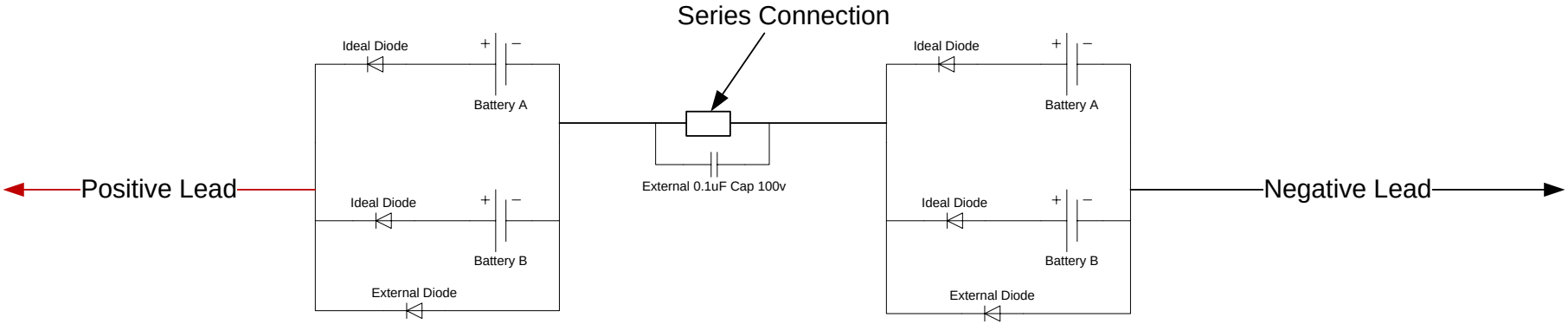
Suggested Parallel Connection Schematic



The addition of the Ideal Diode balancing circuit will assure two batteries are discharged equally and prevent a higher voltage battery from charging a lower state of charge battery. Back to back MOSFETs are desired to prevent leakage through the body diode.

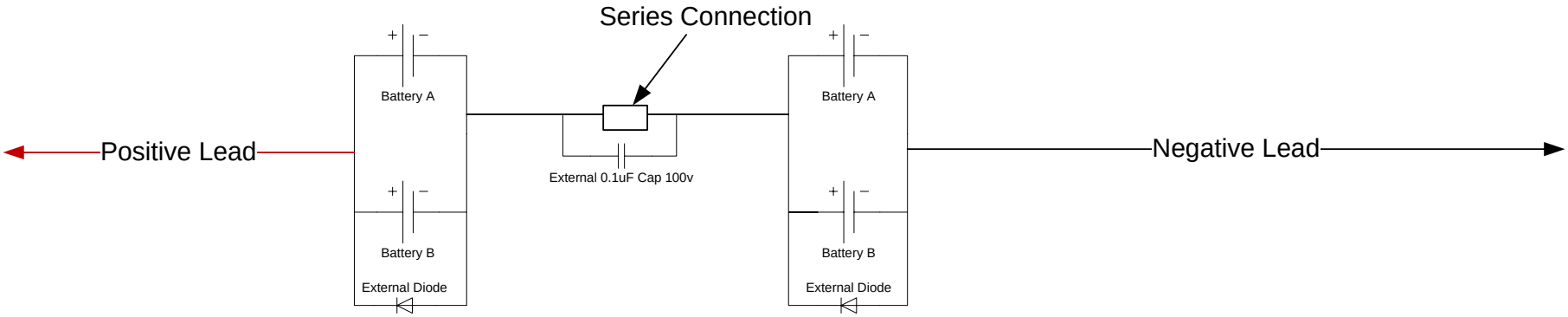
This paper is presented as a helpful guide for users and integrators of the Larson Electronics batteries. Information contained in this document is intended for reference only, and can change at any time. Larson Electronics assumes no responsibility for the content or material provided and/or how it may be interpreted or used. Larson Electronics suggests only experienced designers undertake battery design projects. Please contact Larson Electronics for further assistance as required.

Suggested Parallel and Series Connection Schematic



Batteries placed in parallel then series mode offers a more robust and reliable mode of operation. Ideal Diode controllers assure batteries in parallel sections balance during discharge and higher state of charge batteries do not charge batteries is a lower state of charge. External Diodes help with reliability and robustness of the MOSFET elements during turn on/off. External Capacitor is only required if the series connection can be disconnected during high current operation (i.e. series connection made with breaker, fuse, etc.)

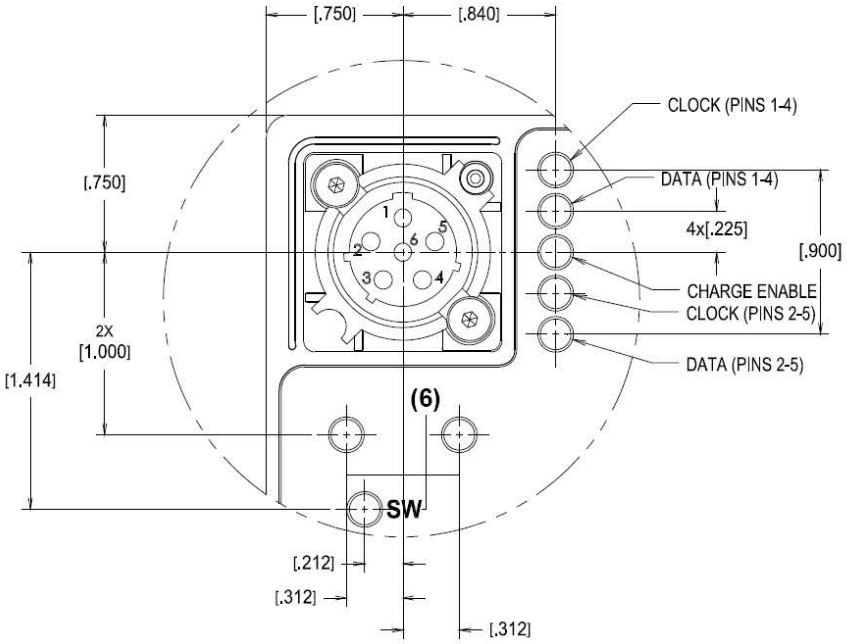
Alternate Parallel and Series Connection Schematic

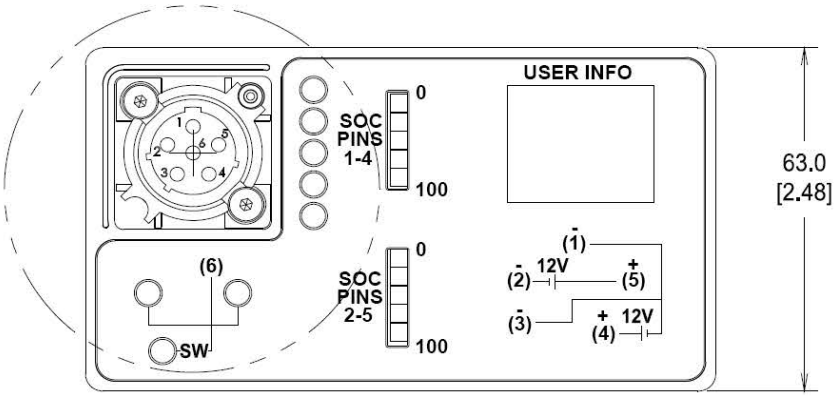


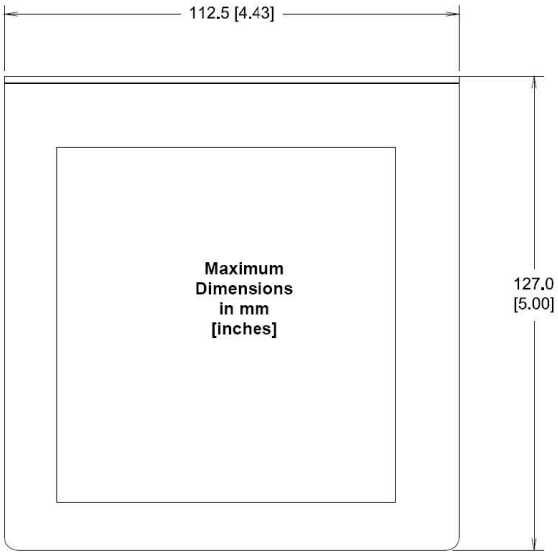
Batteries placed in parallel then series mode offers a more robust and reliable mode of operation. The lack of Ideal diode controllers will allow higher state of charge batteries connected in parallel to lower state of charge batteries to charge. External Diodes help with reliability and robustness of the MOSFET elements during turn on/off. External Capacitor is only required if the series connection can be disconnected during high current operation (i.e. series connection made with breaker, fuse, etc.)

THESE INSTRUCTIONS MAY NOT COVER ALL DETAILS OR VARIATIONS OF THIS PRODUCT FOR YOUR EQUIPMENT OR INSTALLATION REQUIREMENTS. SHOULD FURTHER INFORMATION NOT COVERED BY THESE INSTRUCTIONS BE REQUIRED, PLEASE CONTACT LARSON ELECTRONICS BY EMAIL AT SALES@LARSONELECTRONICS.COM OR BY PHONE AT 1-800-369-6671 FOR FURTHER ASSISTANCE.

PLEASE VISIT LARSONELECTRONICS.COM FOR **WARRANTY** AND **RETURN** INFORMATION.







LARSON ELECTRONICS

TITLE:

BTT-LON-207WH-SMBUS

PROPRIETARY AND CONFIDENTIAL
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		NAME
DIMENSIONS ARE IN INCHES	DRAWN	
MATERIAL	CHECKED	JEREMY BLANKENSHIP
DO NOT SCALE DRAWING		

SIZE	DWG. NO.	REV
A		

SHEET 1 OF 1

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SAFETY DATA SHEET

HAZARDS IDENTIFICATION

NOTE: This Larson Electronics battery product meets the definition of an article. Under the Globally Harmonized System of Classification and Labeling of Chemicals (GHS), “Articles” as defined in the Hazard Communication Standard (29 CFR 1910.1200) of the Occupational Safety and Health Administration of the United States of America, or by similar definition, are outside the scope of the system. [Rev. 2 (2007) Part 1.3.2.1.1]

The materials contained in this product may only represent the hazards identified below if the integrity of the cell or battery is compromised; physically or electrically abused.

GHS Classification

Skin irritation (Category 2)

Skin sensation (Category 1)

Eye irritation (Category 2)

Single target organ toxicity, single exposure (Category 3)

Carcinogen (Category 1B)

GHS Label elements, including precautionary statements

Pictogram



Signal word – DANGER

Hazard statements

H315 Causes skin irritation

H317 May cause an allergic skin reaction

H319 Causes serious eye irritation

H335 May cause respiratory irritation

H350 May cause cancer

SAFETY DATA SHEET

Precautionary statements

P280 Wear protective gloves/protective clothing/eye protection/face protection.

P312 Call a POISON CENTER or doctor/physician if you feel unwell.

P302 + P350 IF ON SKIN: gently wash with plenty of soap and water.

P301 + P330 + P331 IF SWALLOWED: rinse mouth, DO NOT induce vomiting.

P304 + P340 IF INHALED: Move person to fresh air and keep comfortable for breathing.

P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes.

P362 + P352 Take off contaminated clothing and wash before re-use.

P501 Dispose of contents/container in accordance with local/national regulations.

WHMIS Classification

D2A Very toxic material causing other toxic effects

Carcinogen

D2B Toxic material causing other toxic effects

Moderate skin irritant

Skin sensitizer

Moderate respiratory irritant

Moderate eye irritant

OSHA Classification

Hazardous

HMIS Classification

Health Hazard: 2

Chronic Hazards: 0

Flammability: 2

Physical Hazards: 0

Additional Notes:

- Do not open or disassemble.
- Do not expose to fire or open flame.
- Do not mix with batteries of varying sizes, chemistries or types.
- Do not puncture, deform, incinerate or heat above 85^{o}C (185^{o}F).

SAFETY DATA SHEET

SECTION 2 - COMPOSITION – INGREDIENTS INFORMATION

Lithium Cobalt Oxide Type:

12041-2100-01, 12041-2100-02, 12041-2100-03, A3307643, S00072, S00112, S00145, S00225, S00245, S00273, S00301, S00304, S00314, S00335, UBBL02, UBBL03, UBBL06, UBBL08, UBBL09/B, UBBL10, UBBL10/B, UBBL18, UBBL19, UBBL20, UBBL21, UBBL22, UBBL23, UBBL24, UBBL25, UBBL26, UBBL27, UBBL29, UBBL29/B, UBBL31, UBBL35, UBBL64, UBBL65, UBBP01, UBP001, UBP002, UBP010.

Under normal use conditions, cells and batteries do not emit hazardous or regulated substances.

Component	CAS Number	EINECS Number	% by Wt.
Lithium Cobalt Oxide	12190-79-3	NA	10-45
Graphite	7440-44-0	NA	5-20
Ethylene Carbonate – Solvent	96-49-1	NA	3-6
Diethyl Carbonate – Solvent	105-58-8	203-311-1	3-6
Lithium Hexaflurophosphate – Salt	21324-40-3	NA	1-5

Depending on product configuration, components used to assemble battery packs (e.g. housings, electronic components and wiring) may contain additional hazardous materials, such as lead solder.

SECTION 2 (Continued) - COMPOSITION - INGREDIENTS INFORMATION

Lithium Nickel Cobalt Aluminum Type:

1009761, 12041-2200-01, 12041-2200-02, 12041-2200-03, 12041-2400-01, 12041-2400-02, 12041-2400-03, 12041-2420-02, 12500-2500, 299-0600, 817724-6, S00343, SCP0570008, SCP0570117, UBBL02-01, UBBL02-01-CB, UBBL06-01, UBBL06-02, UBBL08-01, UBBL10-01, UBBL10-01-CB, UBBL13, UBBL13-01, UBBL13-01-CB, UBBL34, UBBL36, UBBL38, UBBL39, UBBL62, UBBP06, M975158Axxx, 14002-0214-01, 14002-0214-02, 14035-4010-01, 14035-4010-02, 14035-5050-01, 14035-5050-02.

Under normal use conditions, cells and batteries do not emit hazardous or regulated substances.

Component	CAS Number	EINECS Number	% by Wt.
Lithium Cobalt Nickel Aluminum Oxide	193214-24-3	NA	10-45
Graphite	7440-44-0	NA	5-20
Ethylene Carbonate – Solvent	96-49-1	NA	3-6
Diethyl Carbonate – Solvent	105-58-8	203-311-1	3-6
Lithium Hexaflurophosphate – Salt	21324-40-3	NA	1-5

Depending on product configuration, components used to assemble battery packs (e.g. housings, electronic components and wiring) may contain additional hazardous materials, such as lead solder.

SAFETY DATA SHEET

SECTION 2 (Continued) - COMPOSITION - INGREDIENTS INFORMATION

Lithium Nickel Manganese Cobalt Type:

S00216, S00319, S00209, UBBL05, UBBL07.

Under normal use conditions, cells and batteries do not emit hazardous or regulated substances.

Component	CAS Number	EINECS Number	% by Wt.
Lithium Nickel Manganese Cobalt Oxide	346417-97-8	NA	10-45
Graphite	7440-44-0	NA	5-20
Ethylene Carbonate – Solvent	96-49-1	NA	3-6
Diethyl Carbonate – Solvent	105-58-8	203-311-1	3-6
Lithium Hexaflurophosphate – Salt	21324-40-3	NA	1-5

Depending on product configuration, components used to assemble battery packs (e.g. housings, electronic components and wiring) may contain additional hazardous materials, such as lead solder.

SECTION 3 - FIRST AID MEASURES

Inhalation	• Avoid inhaling any vented gases. • Remove to fresh air immediately. • If breathing is difficult, seek emergency medical attention.
Ingestion	• Consult a physician or local poison control center immediately
Skin Contact	• Exposure to materials from a ruptured or otherwise damaged cell or battery may cause skin irritation. • Flush immediately with water and wash affected area with soap and water.
Eye Contact	• Exposure to materials from a ruptured or otherwise damaged cell or battery may cause eye irritation. • Flush immediately with copious amounts of water for at least 15 minutes; consult a physician immediately.

SECTION 4 - FIRE FIGHTING MEASURES

Extinguishing Media	• Copious amounts of cold water or water-based foam may be used to cool burning cells or batteries. Do not use warm or hot water. • A carbon dioxide (CO_2) extinguisher is also effective. • For fires involving exposed, raw lithium metal (characterized by deep red flames), use only metal (Class D) fire extinguishers. • Do not use Halon type extinguishing material.
Special Fire Fighting Procedures	• Use a positive pressure self-contained breathing apparatus (SCBA) if cells or batteries are involved in a fire. • Full fire fighting protective clothing is necessary.

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	• During water application, caution is advised as burning pieces of flammable particles may be ejected from the fire.
Unusual Fire and Explosion Hazard	• Cells or batteries that are damaged, opened or exposed to excessive heat/fire may flame or leak potentially hazardous organic vapors.

SECTION 5 - ACCIDENTAL RELEASE MEASURES

- In the event a cell or battery is crushed; releasing its contents, rubber gloves must be used to handle all battery components.
- Avoid inhalation of any vapors that may be emitted.
- Damaged batteries that are not hot or burning should be placed in a sealed plastic bag or container.

SECTION 6 - HANDLING AND STORAGE

Precautions for Safe Handling	• Batteries are designed to be recharged. However, improperly charging a cell or battery may cause the product to flame or leak. Use only approved chargers and procedures. • Never disassemble a battery or bypass any safety device. • More than a momentary short circuit will cause temporary battery voltage loss until the battery is subjected to a charge. Batteries have re-settable fuses that can be reactivated through applying a charge to the battery. • Extended short-circuiting creates high temperatures in the cell. • High temperatures can cause burns in skin or cause the cell to flame. • Avoid reversing battery polarity within the battery assembly. To do so may cause cell to flame or to leak.
Conditions for Safe Storage and Incompatibility	• Batteries should be separated from other materials and stored in a non-combustible, well ventilated structure with sufficient clearance between walls and battery stacks. Do not place batteries near heating equipment, nor expose to direct sunlight for long periods. • Do not store batteries above 60ºC (140ºF) or below -20ºC (-4ºF). Store batteries in a cool (below 25°C (77ºF)), dry area that is subject to little temperature change. Elevated temperatures can result in reduced battery service life. Battery exposure to temperatures in excess of 130°C (266ºF) will result in the battery venting flammable liquid and gases. • Do not store batteries in a manner that allows terminals to short circuit.

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SECTION 7 - EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering Controls and Work Practices	• Under conditions of normal use, batteries do not emit hazardous or regulated substances. • No engineering controls are required for handling batteries that have not been damaged.
Personal Protective Equipment	• Personal protective equipment for damaged batteries should include chemical resistant gloves and safety glasses. • In the event of a fire, SCBA should be worn along with thermally protective outer garments.

SECTION 8 - PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Cylindrical cell or pack	UEL/LEL	Not Applicable
Odor	None	Vapor Pressure	Not Applicable
Odor Threshold	Not Applicable	Vapor Density	Not Applicable
pH	Not Applicable	Relative Density	Not Available
Melting Point	Not Available	Solubility	Not Applicable
Boiling Point	Not Available	Partition Coefficient	Not Applicable
Flash Point	Not Applicable	Auto-ignition Temperature	Not Available
Evaporation Rate	Not Applicable	Decomposition Temperature	Not Available
Flammability	Not Applicable	Viscosity	Not Applicable

SECTION 9 - STABILITY AND REACTIVITY

Stability:	Stable
Hazardous Polymerization:	Will Not Occur
Conditions to Avoid:	Prolonged overcharging and/or overheating. It is not recommended that this product be stored above 60°C (140°F).
Hazardous Decomposition:	Carbon Monoxide (CO), and Hydrogen Fluoride (HF)
Reactivity:	Damaged non-discharged batteries contain elemental Lithium that is water reactive. This reaction gives off heat and hydrogen gas

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SECTION 10 – TOXICOLOGICAL INFORMATION

- No toxicological impacts are expected under normal use conditions.
- The electrolytes contained in this cell or battery can irritate eyes with any contact.
- Prolonged contact of electrolytes with lung tissue, skin or mucous membranes may cause irritation.
- Detailed information regarding sensitization, carcinogenicity, mutagenicity or reproductive toxicity related to internal cell or battery components has not been included in this document.

Carcinogen References

1. National Toxicology Program (NTP): No
2. IARC Monographs: No
3. OSHA: No

SECTION 11 – ECOLOGICAL INFORMATION

- No ecological impacts expected under normal use conditions.
- Information on the ecological impact of internal cell or battery components has not been included in this document.

SECTION 12 - DISPOSAL CONSIDERATIONS

Do not dispose in fire. Battery disposal regulations vary on national, state/provincial and local bases. **Disposal must be conducted in accordance with the applicable regulations.**

These batteries contain recyclable materials and recycling is encouraged over disposal.

SECTION 13 - TRANSPORTATION INFORMATION

Ultralife's lithium metal primary cells and batteries and lithium-ion cells and batteries are classified and regulated as Class 9 dangerous goods (also known as "hazardous materials" in the United States) by the International Civil Aviation Organization (ICAO), International Air Transport Association (IATA), International Maritime Organization (IMO) and many government agencies such as the U.S. Department of Transportation (DOT). These organizations and agencies publish regulations that contain detailed packaging, marking, labeling, documentation, and training requirements that must be followed when offering (shipping) Ultralife's cells and batteries for transportation. **However, small cells and batteries are not subject to certain provisions of the regulations (e.g. Class 9 labeling and UN specification packaging) if they meet specific requirements**. The regulations are based on the UN Recommendations on the Transport of Dangerous Goods Model Regulations and the UN Manual of Tests and Criteria. **These regulations also apply to shipments of cells and batteries that are packed with or contained in equipment.** Failure to comply with these regulations can result in substantial civil or criminal penalties.

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The dangerous goods regulations require that each cell and battery design be subject to tests contained in Section 38.3 of the UN Manual of Tests and Criteria prior to being offered for transport.
Approved, production level cells and batteries manufactured and assembled by Ultralife have been tested to Section 38.3 of the UN Manual of Tests and Criteria and passed T1 through T8.
Batteries or battery packs constructed by other parties using Ultralife's cells must be subjected to the tests contained in Section 38.3 of the UN Manual of Tests and Criteria.

Important Note Regarding Prototype Cells and Batteries

Ultralife Corporation is permitted to ship prototype cells and batteries as Class 9 hazardous materials/dangerous goods in accordance with the requirements contained in a competent authority approval; provided by the US Department of Transportation. Recipients of these shipments are prohibited from reshipping unless they have received a similar approval from the governing Competent Authority.

SECTION 13 - TRANSPORTATION INFORMATION (continued)

Air, Sea and Surface Classification	UN 3480, Lithium Ion batteries UN 3481, Lithium Ion batteries, contained in equipment UN 3481, Lithium Ion batteries, packed with equipment

IATA Packaging Guidance

UN3480 Lithium Ion Batteries:

PI965 Section IA batteries more than 100Wh or single cell more than 20Wh.
Section IB batteries less than 100Wh or single cell less than 20Wh -.
Section II batteries less than 100Wh or single cell less than 20Wh -max 2 batteries

UN3481 Lithium Ion Batteries contained in Equipment

PI967 Section I batteries more than 100Wh or single cell more than 20Wh.
Section II batteries less than 100Wh or single cell less than 20Wh

Lithium Ion Batteries packed with equipment

PI966 Section I batteries more than 100Wh or single cell more than 20Wh.
Section II batteries less than 100Wh or single cells less than 20Wh

Hazard Class	9	Tunnel Code	E		
Stowage Location	A	Marine Pollutant	No		

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SECTION 14 - REGULATORY INFORMATION

US	Hazard Communication Standard (29 CFR 1910.1200)	Article
	CERCLA SECTION 304 Hazardous Substances	NA
	EPCRA SECTION 302 Extremely Hazardous Substance	NA
	EPCRA SECTION 313 Toxic Release Inventory	NA
	EPCRA SECTION 312	NA
	Components Listed on US Toxic Substances Control Act (TSCA) Inventory	Yes
	California Prop 65 Classification	None
EU	Registration, Evaluation, Authorization and Restriction of Chemicals (REACH) 1907/2006	Article
	European RoHS2 Directive 2011/65/EU	Not Applicable
	European WEEE Directive 2012/19/EU Note: Applies to cells and batteries incorporated into electrical and electronic equipment, when that equipment becomes waste.	See Note

SECTION 15 - OTHER INFORMATION

If returning product to any division of Ultralife, consult the relevant regulations regarding handling, packaging, labeling and transportation.

For UBBL29 and UBBL29/B Products

External Battery Finish – Reference MSDS for Sherwin Williams MIL-DTL-64159 (approx. 8 grams)

PCB Coating – Reference MSDS for Humiseal 1B73 Aerosol (approx. 0.6 grams)

Li-Ion Cells – Reference MSDS for Molicel Cobalt-based Lithium-Ion Cells (approx. 768 grams)

For UBBL31 Products

Battery Case Material – Reference MSDS for Sabic Noryl® N190X-701 (approx. 132 grams)

PCB Coating – Reference MSDS for Humiseal 1B73 Aerosol (approx. 0.6 grams)

Li-Ion Cells – Reference MSDS for Molicel Cobalt-based Lithium-Ion Cells (approx. 1152 grams)

NSN # List

6140-01-553-3527 (for UBBL02, UBBL02-01)

6140-01-620-0555 (for UBBL03)

6140-01-542-4380 (for UBBL06)

6140-01-590-4132 (for UBBL07)

6140-01-580-6190 (for UBBL08)

6140-01-620-8528 (for UBBL09/B)

6140-01-554-2347 (for UBBL10, UBBL10-01)

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6140-01-611-0192 (for UBBL13, UBBL13-01)
6140-01-625-9659 (for UBBL13-01)
6140-01-573-4968 (for UBBL29)
6140-01-583-0570 (for UBBL29/B)
6140-01-573-6374 (for UBBL31)
6140-01-625-7254 (for UBBL35)
6140-01-592-5521 (for A3307643-1)
6140-01-592-5521 (for 1009761)
6140-01-551-8898 (for 12041-2100-01)
6140-01-548-7566 (for 12041-2100-02)
6140-01-628-0941 (for 12041-2100-03)
6140-01-612-9653 (for 12041-2200-01)
6140-01-548-7566 (for 12041-2200-02)
6140-01-548-7566 (for 12041-2400-02)

Disclaimer

The information contained herein is furnished without warranty of any kind. Users should consider this data only as a supplement to other information gathered by them and must make independent determinations of the suitability and completeness of information from all sources to assure proper use and disposal of these materials and the safety and health of employees and customers.

Frequently Asked Questions (FAQ)