Battery

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www.flir.com

Customer support

support.flir.com

Export control

Products described herein may be subject to export regulations. This document does not contain export-controlled information.



General description
High capacity battery for the IR camera.

Power system	
Battery type	Rechargeable Li-ion battery
Battery voltage	3.6 V
Battery operating time	4 hours at 25°C (68°F) with typical use
Charging time (using two-bay charger)	3.5 h to 90% capacity

Environmental data

Physical data	
Weight	195 g (6.89 oz.)
Size (L × W × H)	59 × 66 × 94 mm (2.3 × 2.6 × 3.7 in.)

Shipping information	
Packaging, type	Cardboard box
List of contents	• Battery
Packaging, weight	
Packaging, size	220 × 160 × 75 mm (8.7 × 6.3 × 2.9 in.)
EAN-13	4743254003378
UPC-12	845188014797
Country of origin	Romania

Safety Data Sheet
MSDS 2.001.031

Rechargeable Lithium-Ion Battery
Series: LIC..., LIP..., LPP...

1 Identification of the product and of the company undertaking

Product details

Trade name	Rechargeable lithium ion battery
Electrochemical system:	Lithium ion
Anode (negative):	Carbon (proprietary)
Cathode (positive):	Metal oxide (proprietary)

This MSDS applies to the following cell types and batteries assembled from these types.

The values listed for energy and voltage are given for reference only; they are not contractual assurances of product attributes and may differ from values given in specifications, data sheets or other documents or on the products.

Type	Energy per cell	Nominal voltage per cell
LIC 14500 PD	3.0 Wh	3.7 V
LIC 18650-15 LC	5.6 Wh	3.6 V
LIC 18650-20 RC	7.2 Wh	3.6 V
LIC 18650-22 AL *	7.9 Wh	3.6 V
LIC 18650-22 BT	8.1 Wh	3.6 V
LIC 18650-22 FC	8.0 Wh	3.6 V
LIC 18650-22 PC	7.8 Wh	3.7 V
LIC 18650-22 S3B *	8.0 Wh	3.6 V
LIC 18650-25 FKD	9.3 Wh	3.7 V
LIC 18650-26 FC	9.6 Wh	3.7 V
LIC 18650-26 HC	9.4 Wh	3.7 V
LIC 18650-26 JC	9.5 Wh	3.63 V
LIC 18650-26SKE	9.5 Wh	3.65 V
LIC 18650-29 EC	10.4 Wh	3.7 V
LIC 18650-29 FC	10.7 Wh	3.7 V
LIC 18650-30 BC	11.2 Wh	3.7 V
LIC 18650-32MH1B	11.8 Wh	3.7 V
LIC 18650-35EC	12.2 Wh	3.6 V
LIC 18650-FTC1H	3.5 Wh	3.2 V
LIC 18650-M26B	9.4 Wh	3.6 V

* These cells contain SVHC substances $>$ 0.1 % (see section 3)

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Type	Energy per cell	Nominal voltage per cell
LIC 18650-M26SB	9.4 Wh	3.6 V
LIC 18650-M29B	10.5 Wh	3.67 V
LIC 18650-VTC4H	7.6 Wh	3.6 V
LIC 18650-VTC5AH	9.4 Wh	3.6 V
LIC 26650-30 H	9.6 Wh	3.2 V
LIP 103450 AC	8.4 Wh	3.7 V
LIP 103450 SC	7.5 Wh	3.7 V
LIP 103450-CAT	7.3 Wh	3.7 V
LIP 383450 AJL *	2.8 Wh	3.7 V
LIP 423048 AJL *	2.6 Wh	3.7 V
LIP 423450 AJL *	3.2 Wh	3.7 V
LIP 423450 AR	3.0 Wh	3.7 V
LIP 463048 FD	2.7 Wh	3.7 V
LIP 523450 AJL *	4.1 Wh	3.7 V
LIP 553450 WC	4.2 Wh	3.7 V
LIP 663450 MTC	4.9 Wh	3.7 V
LPP 383450 PL *	2.6 Wh	3.7 V
LPP 402025 CE *	0.5 Wh	3.7 V
LPP 402934 E *	1.1 Wh	3.7 V
LPP 422339 PL *	1.3 Wh	3.7 V
LPP 423566 BE *	4.2 Wh	3.7 V
LPP 442834 PVL *	1.5 Wh	3.7 V
LPP 443441 S *	2.4 Wh	3.7 V
LPP 454261 8TH	5.9 Wh	3.7 V
LPP 454261 8TSH	5.9 Wh	3.7 V
LPP 463149 S *	2.6 Wh	3.7 V
LPP 486588 H	13.0 Wh	3.7 V
LPP 503562 S *	4.5 Wh	3.7 V
LPP 503759 8HH	5.2 Wh	3.7 V
LPP 503759 DL *	4.6 Wh	3.7 V
LPP 523450 S *	3.7 Wh	3.7 V
LPP 553048 PL *	3.0 Wh	3.7 V
LPP 553436 S *	2.9 Wh	3.7 V
LPP 683566 BE *	6.7 Wh	3.7 V
LPP 702035 PVL *	1.6 Wh	3.7 V
LPP 702035 S *	1.6 Wh	3.7 V
LPP 751930 PL *	1.5 Wh	3.7 V

* These cells contain SVHC substances $>$ 0.1 % (see section 3)

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Nürnberger Straße 65
D-86720 Nördlingen
Germany

Supplier details

Address: VARTA Storage GmbH
Nürnberger Straße 65
D-86720 Nördlingen
Germany

Emergency Phone Number: +49 7961 921 110 (VAC)

Legal remark (EU)

These batteries are no *"substances"* or *"mixtures"* according to Regulation (EC) No 1907/2006 EC. Instead they have to be regarded as *"articles"*, no substances are intended to be released during handling. Therefore there is no obligation to supply a safety data sheet according to Regulation (EC) 1907/2006, Article 31.

General remark

This information is provided as a service to our customers. The details presented are in accordance with our present knowledge and experiences. They are no contractual assurances of product attributes.

2 Hazards identification

The battery is sealed hermetically. Thus, the ingredients have no hazard potential, except the battery is violated or dismantled.

If in case of mistreatment the ingredients are released, a spontaneously flammable gas mixture may be released under certain circumstances (measures according to sections 4 to 6).

Attention: If batteries are treated wrong the danger of burns or bursts occurs. Batteries must not be heated above 100 °C or incinerated. The battery contents must not get in contact with water. If the negative electrode gets in contact with water or humidity hydrogen gas is formed, which may inflame spontaneously.

3 Composition/information on ingredients

Ingredients

Content	CAS no.	EC no.	Material	Hazard Categories	Hazard Statements
20 – 50 %	proprietary	proprietary	Metal oxide (proprietary)	Skin Sens. 1, Acute Tox. 2, Resp. Sens. 1, Carc. 1B, STOT RE 1, Aquatic Chronic 3	H317, H330, H334, H350, H372, H412
10 – 30 %	proprietary	proprietary	Carbon (proprietary)		
10 – 20 %	proprietary	proprietary	Electrolyte (proprietary)	Flam. Liq. 2, Skin Corr. 1B, Eye Dam. 1, Skin Sens. 1, Muta. 2, Carc. 2, Aquatic Chronic 2	H225, H312, H314, H317, H341, H351, H411

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Content	CAS no.	EC no.	Material	Hazard Categories	Hazard Statements
2 – 10 %	7429-90-5	231-072-3	Aluminum foil		
2 – 10 %	7440-50-8	231-159-6	Copper foil		
<5 %	proprietary	proprietary	Binder		
Remainder	proprietary	proprietary	Inert materials		

For full text of hazard statements see section 16.

During charge process a lithium carbon intercalation phase is formed, which is highly flammable and corrosive, but not released under the circumstances of normal usage.

SVHC substances according to REACH (Article 33)

Content	CAS no.	EC no.	Material
> 0.1 %	1120-71-4	214-317-9	1,3-Propanesultone (only for cells marked with * in section 1)

For information to allow safe use: see section 7.

Substances relevant for Battery Directive 2006/66/EC

Content	CAS no.	EC no.	Material
<0.0010 %	7439-92-1	231-100-4	Lead
<0.0001 %	7440-43-9	231-152-8	Cadmium
<0.0001 %	7439-97-6	231-106-7	Mercury (none intentionally introduced, see section 12)

4 First-aid measures

After inhalation:	Fresh air. Seek for medical assistance.
After skin contact:	Remove solid particles immediately. Flush affected areas with plenty of water (at least 15 min). Remove contaminated cloth immediately. Seek for medical assistance.
After eye contact:	Flush the eye gently with plenty of water (at least 15 min). Seek for medical assistance.
After ingestion of battery components:	Drink plenty of water. Avoid vomiting. Seek for medical assistance. No trials for neutralization.

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5 Fire-fighting measures

Suitable extinguishing media:	Metal fire extinction powder, rock salt or dry sand shall be used. In case only water is available, it can be used in large amounts.
Extinguishing media with limited suitability:	Carbon dioxide (CO_2) is not suitable. Water in small quantities may have adverse effects.
Special protection equipment during fire-fighting:	Contamination cloth including breathing apparatus.
Special hazard:	Cells may explode and release metal parts. At contact of electrolyte with water traces of hydrofluoric acid may be formed. In this case avoid contact and take care for good ventilation. At contact of charged anode material with water extremely flammable hydrogen gas is generated.
Attention:	Do not let used extinguishing media penetrate into surface water or ground water. If necessary, thicken water or foam with suitable solids. Dispose of properly.

6 Accidental release measures

Person related measures:	Wear personal protective equipment adapted to the situation (protection gloves, face protection, breathing protection).
Environment protection measures:	In the event of battery rupture, prevent skin contact and collect all released material in a plastic lined container. Bind released ingredients with powder (rock salt, sand). Dispose of according to the local law and rules. Avoid leached substances to penetrate into the earth, canalization or water.
Treatment for cleaning:	If battery casing is dismantled, small amounts of electrolyte may leak. Package the battery tightly including ingredients together with lime, sand or rock salt. Then clean with water.

7 Handling and storage

Guideline for safe handling:

- Always follow the warning information on the batteries and in the manuals of devices. Only use the recommended battery types.
- Keep batteries away from children. Keep small cells and batteries which are considered swallowable out of the reach of children.
- For devices to be used by children, the battery casing should be protected against unauthorized access.
- Unpacked batteries shall not lie about in bulk.
- In case of battery change always replace all batteries by new ones of identical type and brand.
- Do not swallow batteries. Swallowing may lead to burns, perforation of soft tissue, and death. Severe burns can occur within 2 h of ingestion. In case of ingestion of a cell or battery, seek medical assistance promptly.
- Do not throw batteries into water.
- Do not throw batteries into fire.
- Avoid deep discharge.
- Do not short-circuit batteries.
- Use recommended charging time and current.
- Do not open or disassemble batteries.

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Supply to private end users:	In case the products are supplied to private end users packed with equipment or contained in equipment it is strongly recommended to follow UL product and instruction manual requirements. The product is required to be marked with a graphical symbol that alerts the user to refer to the instruction manual. The instruction manual itself is required to contain • a warning marking with text to alert the user of the potential chemical burn hazard associated with coin/button battery ingestion, • an instruction as to the presence of a coin/button cell battery, • possible effects of battery ingestion, • an instruction to keep batteries away from children, • an advice to seek immediate medical attention if it suspected that batteries have either been swallowed or placed inside any part of the body. Further advice for parents: http://buttonbatterysafety.com http://www.productsafety.gov.au/news/the-battery-controlled-button-battery-safety
Environmental conditions:	–20 °C to 20 °C for storage –20 °C to 60 °C for short exposition (e.g. transport) Avoid large temperature changes. Do not store close to heating devices. Avoid direct sunlight. At higher temperature the electrical performance may be reduced. Storage of unpacked batteries can cause short circuit and heat generation.
Storage category according to TRGS 510:	It is recommended to consider the *"Technical Rule for Hazardous Substances TRGS 510 - Storage of hazardous substances in nonstationary containers"* and to handle lithium ion batteries according to storage category 11 (*"combustible solids"*).
Storage of large amounts:	Follow the recommendations of the German Insurance Association (GDV - *"Gesamtverband der Deutschen Versicherungswirtschaft e.V."*) concerning lithium batteries: VdS 3103. In case of storage of large amounts (used storage volume $> 7\,m^3$ and/or more than 6 pallets) batteries shall be stored in fire-resistant or separated rooms or areas (e.g. warehouse or container for hazardous materials). Mixed storage with other products is not allowed. The storage area shall be monitored by an automatic fire detection system, connected to a permanently manned place. A fire-extinguishing system shall reflect the extinguishing agents mentioned in section 5.

8 Exposure controls/personal protection

Under normal conditions (during charge and discharge) release of ingredients does not occur.

9 Physical and chemical properties

Not applicable if closed.

10 Stability and reactivity

Dangerous reactions:	When heated above 100 °C the risk of rupture occurs.

11 Toxicological information

Under normal conditions (during charge and discharge) release of ingredients does not occur. In case of accidental release see information in sections 2 to 4 and 6.

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Swallowing of a battery can be harmful. Call the local Poison Control Centre for advice and follow-up. See section 4.

12 Ecological information

VARTA LIC/LIP/LPP series lithium ion batteries do not contain heavy metals as defined by the European directives 2006/66/EC Article 21; they comply with the chemical composition requirements of this Directive.

Mercury has not been *"intentionally introduced (as distinguished from mercury that may be incidentally present in other materials)"* in the sense of the U.S.A. *"Mercury-Containing and Rechargeable Battery Management Act"* (May 13 1996).

The Regulation on Mercury Content Limitation for Batteries promulgated on 1997-12-31 by the China authorities including the State Administration of Light Industry and the State Environmental Protection Administration defines *"low mercury"* as *"mercury content by weight in battery as less than 0.025 %"*, and *"mercury free"* as *"mercury content by weight in battery as less than 0.0001 %"*. And therefore: VARTA LIC/LIP/LPP series lithium ion batteries belong to the category of mercury-free battery (mercury content lower than 0.0001 %).

13 Disposal considerations

In order to avoid short circuit and heating, used VARTA LIC/LIP/LPP series lithium ion batteries should never be stored or transported in bulk. Proper measures against short circuit are:

- Storage of batteries in original packaging
- Coverage of the terminals
- Embedding in dry sand

European Union

In the European Union, manufacturing, handling and disposal of batteries is regulated on the basis of the DIRECTIVE 2006/66/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 6 September 2006 on batteries and accumulators and waste batteries and accumulators and repealing Directive 91/157/EEC. Customers find detailed information on disposal in their specific countries using the web site of the European Portable Batteries Association (www.epbaeurope.net/legislation_national.html).

Importers and users outside EU should consider the local law and rules.

USA

VARTA LIC/LIP/LPP series lithium ion batteries are classified by the federal government as non-hazardous waste and are safe for disposal in the normal municipal waste stream. These batteries, however, do contain recyclable materials and are accepted for recycling by Call2Recycle, Inc. Please go to their website at www.call2recycle.org for additional information.

14 Transport information

VARTA LIC/LIP/LPP series lithium ion batteries are considered to be UN 3480 Lithium Ion Batteries, and are tested according to subsection 38.3 of the *"UN Manual of Tests and Criteria"* for compliance with the requirements of special provisions ADR 188, IMDG 188, as well as the requirements of DOT / 49 CFR § 173.185, and the requirements of IATA DGR packing instruction 965. Test results as well as other relevant information required for transportation are given in dedicated *"Supplier's Test Summaries"*.

Please note that for some products state of charge and VARTA packaging are not designed for air transport in bulk; this does not affect air transport of batteries packed with equipment or contained in equipment.

Transportations of cells or batteries packed with equipment or contained in equipment have to follow the appropriate regulations for UN 3481.

During the transportation of large amounts of batteries by ship, trailer or railway, do not store them in places of high temperature and do not allow them to be exposed to condensation. During the transportation do not allow the packaging to be damaged,

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D-86720 Nördlingen
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Supplier's Test Summary

in accordance with UN Manual of Tests and Criteria
Part III, subsection 38.3
ST/SG/AC.10/11/Rev.6/Amend.1

Test report identification no.:	2019-04-17-01	
Producer:	VARTA Microbattery SRL Bulevardul Grivitei 1X, 500177 Brașov, ROMANIA	
Test Laboratory:	Application Test Lab PT. VARTA Microbattery (Indonesia) Batam Industrial Park Jalan Angsana BLK 309 & 310, Mukakuning Pulau Batam Riau 29433 Indonesia	
Lab-internal reference no.:	JT60807	
Lab-internal test date:	2016-10-20	
Object of the declaration:	*Type of battery:*	Rechargeable Lithium ion battery
	Article:	3P/LIC18650-29EC PCM PC – SOC 30%
	Material no.:	717115
	VKB no.:	56636 703 099
	IEC Designation:	1INR19/65-3
	Voltage:	3.65V
	Watt-hour rating:	32Wh
	Mass (approx.):	158 g

The object of the declaration described above is in conformity with the requirements of the following document:

Documents No.	*Title*	*Edition / Date of issue*
ST/SG/AC.10/11/Rev.5/ Amend. 1	Recommendations on the Transport of Dangerous Goods, UN Manual of Tests and Criteria, Part III, subsection 38.3	2011

List of tests conducted and results:

Test Item	Test Result
T1. Altitude simulation	Pass
T2. Thermal test	Pass
T3. Vibration	Pass
T4. Shock	Pass
T5. External short circuit	Pass
T6. Impact	Pass*
T7. Overcharge	Pass
T8. Forced Discharge	Pass*

**Reference to report of LIC18650-29EC cell*

Additional information:

In original VARTA packaging the products comply with the following special provisions of international transport regulations:

- IATA DGR: Packing Instruction 965 Section IB (max. 30 % state of charge)
  (Transportations of cells or batteries packed with equipment or contained in equipment have to follow Packing Instructions 966 or 967 Section II.)
- ADR/RID/ADN/IMDG Code: Special Provision 188
- DOT / 49 CFR: §173.185 (c)

The products have been manufactured under a quality management programme according to IATA DGR clause 3.9.2.6, ADR clause 2.2.9.1.7 (e) and IMDG code clause 2.9.4.5.

Singapore, 17 April 2019
(place and date of issue)

(company stamp)

(signature)
(Low Chee Leong)
Manager
Technical Support

VARTA Microbattery Pte Ltd
300 Tampines Avenue 5
#05-01 Tampines Junction
Singapore 529653

Phone : (65) 6260 5801
Fax : (65) 6260 5812
info@varta-microbattery.com
www.varta-microbattery.com
RCB (Certificate of Incorporation) No. 197201703K

A Company of **VARTA AG**, Daimlerstr. 1, 73479 Ellwangen, Germany