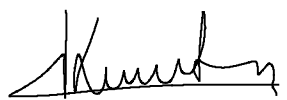




STANDARD SPECIFICATION

Non-rechargeable Li-SOCl₂ cell

LST 14250 Type

| | Name | Position | Date | Signature |
|-------------|---------------|-------------------------|-------|---|
| Written by | A. Kerouanton | Lithium Product Manager | 10/03 |  |
| Checked by | D. Charlton | Lithium Quality Manager | 10/03 |  |
| Approved by | PM. Leroy | Lithium Sales Director | 10/03 |  |

| | | | | | |
|------------|---------------|---------------|--|--|--|
| Issued by | A. Kerouanton | A. Kerouanton | | | |
| Date | 12/02 | 10/03 | | | |
| Edition Nr | 1 | 2 | | | |



RECORD OF REVISIONS

| REVISION DATE | EDITION NUMBER | REVISION PAGE | MODIFICATIONS |
|---------------|----------------|--------------------|--|
| 12/02 | 1 | All | Creation |
| 10/03 | 2 | 6 § 6c 11 to 16 | 85°C → 100°C Adjusted cell dimensions |
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1. Subject

This specification presents typical and guaranteed ex-works values for the Lithium-Thionyl Chloride (Li-SOCl₂) cell type LST 14250 (IEC standard ½ R6, ANSI standard ½ AA).

This cell is intended for high energy applications, preferably not exceeding 15 mA (pulse conditions ; higher continuous current drains are achievable), requesting good voltage response and operating life in - 60/+ 85°C environments.

2. Typical values

A. Designation

LST 14250 (*ex-T04/8AA*)

B. Nominal voltage

3.6 V (*on 36 kΩ/0.1 mA at + 20°C*).

C. Nominal capacity

1.0 Ah (*on 2.4 kΩ/1.5 mA, at + 20°C, cut-off voltage 2 V*).

(The capacity returned by the cell varies according to the current drain, the temperature and the voltage cut-off).

D. Maximum recommended continuous current

40 mA

(to get 50 % of the nominal capacity at + 20°C to a 2 V cut-off. Higher currents are possible. Consult Saft).

E. Maximum recommended pulse current

Typically up to 15 mA. The cell voltage response varies according to pulse characteristics (frequency, duration), temperature, cell history (storage conditions prior to usage) and the application's acceptable minimum voltage. *Consult Saft for case by case study.*

The use of parallel capacitor to enhance the voltage during the first tens of millisecond of the pulses might be recommended. *Consult Saft.*

F. Operating temperature range

- 60/+ 85°C

(short excursions up to 120°C possible without leakage but external sleeve deterioration may occur above 100°C).

(Operation above ambient temperature may lead to reduced capacity and lower voltage readings at the beginning of pulses).

G. Typical weight

9.4 grams.

3. Construction and visual aspect

A. Construction

The LST 14250 cell is constructed according to the concentric electrodes "bobbin" technology.

A glass-to-metal seal ensures the hermeticity of the cell ($\leq 10^{-7}$ atm.cc/sec under 1 atm He).

B. Visual aspect

When inspected by eye, the LST 14250 cell should not show any trace of dents, swelling, corrosion or electrolyte leakage. Marking should be readable.

4. Environment and mechanical tests

A. Altitude simulation

The LST 14250 cell complies with the UN** and IEC*** tests which consist of storage at +20°C for at least 6 hours under an absolute pressure of 11.6 kPa ($\approx 15,240$ m altitude) without any leakage, fire, vent or explosion.

B. Free fall

The LST 14250 cell complies with the IEC*** test which consists of 2 drops/plane (6 in total, samples randomly oriented) onto a concrete floor from an height of 1.0 m without any leakage, vent, explosion or fire.

C. Vibration

The LST 14250 cell complies with the UL* and IEC*** tests which consist of the following:

- Frequency span : 10 to 55 Hz.
- Peak to peak amplitude : 1.6 mm.
- Test duration : 95 ± 5 mm per axis.

Test carried out on three perpendicular axes. The cell must retain its operational characteristics and normal visual aspect.

D. Mechanical shock

The LST 14250 cell complies with the UL* and IEC*** tests which consist of performing the following:

- Average acceleration : 75 g.
- Maximum acceleration : 125 - 175 g.

Shocks applied to each of the three perpendicular axes. The cell must retain its operational characteristics and normal visual aspect.

Safety standards mentioned:

- *UL Underwriters Laboratories Inc.
"Standard for Lithium Batteries" – UL 1642 – Third Edition – 1995
- **UN Secretariat of the United Nations
"Model Regulations on the Transport of Dangerous Goods"
Ref. ST/SG/AC.10/1 – Revision 13 – 2003
+ "Manual of Tests and Criteria"
Ref. ST/SG/AC.10/11 – Revision 3 – Amendment 1 "Lithium Batteries"
– 2002
- ***IEC International Electrotechnical Commission
International safety standard for lithium batteries
"IEC-CEI 86-4" – First Edition – 1996

5. Storage

Before use the LST 14250 cell should be stored in dry and cool conditions, at a temperature preferably not exceeding + 30°C.

Storage at higher temperature is possible but it may affect later the cell capacity and its ability to show good start up voltage characteristics.

6. Safety

We advise, during use of the LST 14250 cell, the following precautions should be observed:

- a) Do not remove the cells from their original packing before use.
- b) Do not store the cells in bulk in order to avoid accidental short circuiting.
- c) Do not heat above 100°C or incinerate.
- d) Do not disassemble.
- e) Do not recharge.
- f) Do not solder directly on the cell. *(use tabbed cell finish versions instead).*
- g) Do not mix new and used cells or cells from different origins.
- h) Respect the polarities of the cell.

The LST 14250 cell is recognized as "Technician Replaceable" by the Underwriters Laboratories Inc. under the file number MH 12802.

The LST 14250 cell complies with the International Electrotechnical Commission (IEC) Safety Standard IEC-CEI 86-4.

7. Transport

The LST 14250 cell has demonstrated an ability to pass the safety tests listed in the United Nations "Recommendations on the Transport of Dangerous Goods – Manual of Tests and Criteria" Reference ST/SG/AC.10/11 Revision 3 : Amendment 1 "Lithium Batteries" – 2002.

Hence, and in accordance with the United Nations "Model Regulations on the Transport of Dangerous Goods" Reference ST/SG/AC.10/1 – Revision 13 – 2003, the LST 14250 cell, which contains less than 1 gram of lithium metal, is declared as non-restricted to transport.

8. Guaranteed minimum values

| | Initial [*] | Up to 12 months storage ^{**} in the recommended + 30°C max. conditions |
|---|----------------------|---|
| Open Circuit Voltage (OCV) | 3.640 V | 3.640 V |
| On Load Voltage (after 5 seconds on 500 Ω ± 1 % at + 20°C) (I ≈ 6 mA) | 3.30 V | 3.10 V |
| Capacity (on 2400 Ω ± 1 % at + 20°C 2 V cut-off) | 0.90 Ah | 0.87 Ah |

9. Incoming inspection

Prior to release from factory, the LST 14250 cell is 100 % inspected for Open Circuit Voltage (OCV) and On Load Voltage.

The capacity, visual aspect and dimensions are checked by sampling.

In case of incoming inspection, Saft recommends the following:

A. Sampling standards

| French | British | German | American | ISO |
|--------------------------|--------------------|---------------------------|------------------------------|--------------|
| NFX 06-022 NFX 06-023 | BS 6001 BS 6002 | DIN 40080 DIN ISO 3951 | MIL STD 10 5D MIL STD 414 | 2859 3951 |

* Initial : Within one month following the date code printed on the sleeve.

** Following the date code printed on the sleeve.

B. Acceptable Quality Levels (AQL)

| Cell lot size | Sampling size | AQL |
|----------------|---------------|--------|
| 1 – 3 200 | 32 | 0.4 % |
| 3 201 – 10 000 | 50 | 0.25 % |
| > 10 000 | 80 | 0.15 % |

10. Labelling

The external surface of the LST 14250 cell displays the following:

SAFT LITHIUM LST 14250 Made in U.K. 3.6 V

+/- polarities UL logo Crossed trash can logo

Safety warning

Cell finish date code with year/day.

Example:

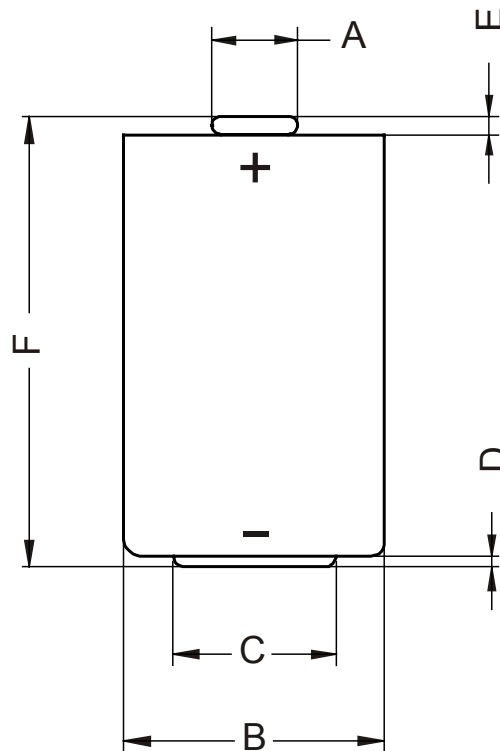
03 097

(cell finished the 97th day of year 2003)

11. Untabbed/sleeved cell external dimensions

(dimensions in mm)

P/N T04/8AA.1



| LST 14250 | A | B | C | D | E | F |
|-----------|----------|-------------|-----------|-----------|-----------|--------------|
| | 4.4 maxi | 14.4 ± 0.15 | 8.7 ± 0.3 | 0.5 ± 0.1 | 1.2 ± 0.2 | 24.85 ± 0.25 |

12. Main cell finish versions

A. LST 14250 CNR

(version with 2 rectangular nickel-plated steel radial tabs running in the same direction) P/N T04/8AA.10

B. LST 14250 2PF

(version with 2 nickel-plated steel radial tabs featuring 1 prong on each side) P/N T04/8AA.6

C. LST 14250 3PF

(version with 2 nickel-plated steel radial tabs featuring 2 prongs on + side and 1 prong on – side) P/N T04/8AA.11

D. LST 14250 3PF RP

(version with 2 nickel-plated steel radial tabs featuring 2 prongs on – side and 1 prong on + side) P/N T04/8AA.9

E. LST 14250 CNA

(version with 2 tinned-copper axial leads) P/N T04/8AA.8

F. LST 14250 CNR OP

(version with 2 rectangular nickel-plated steel radial tabs running in opposite directions) P/N T04/8AA.2

See corresponding drawings on the following pages.

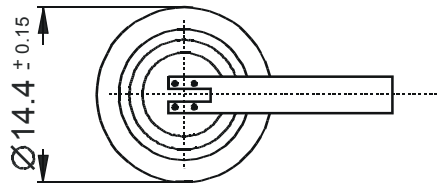
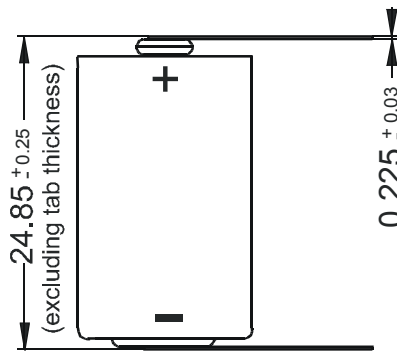
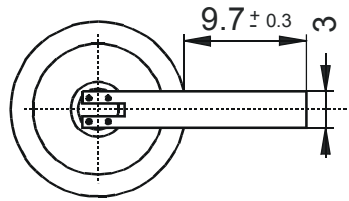
Other finish versions are available on request. Consult Saft

LST 14250 CNR

P/N T04/8AA.10

(dimensions in mm)

Version with 2 rectangular nickel-plated steel radial tabs running in the same direction



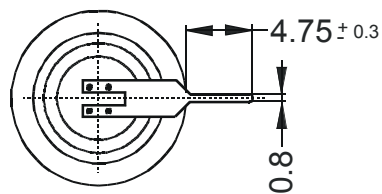
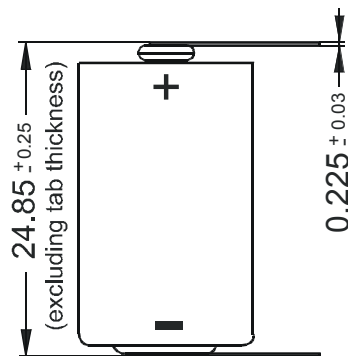
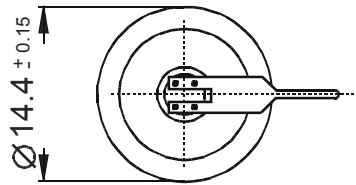


LST 14250 2PF

P/N T04/8AA.6

(dimensions in mm)

**Version with 2 nickel-plated steel radial tabs
featuring 1 prong on each side**



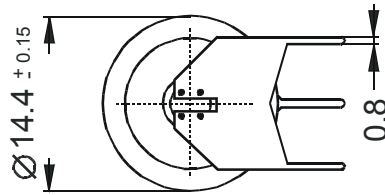
LST 14250

LST 14250 3PF

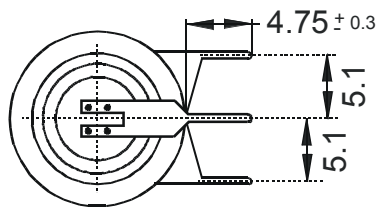
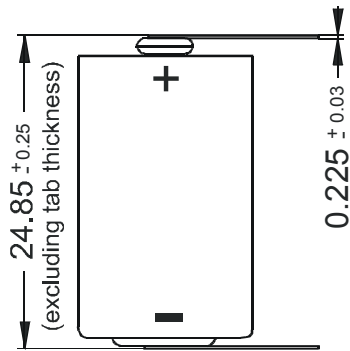
P/N T04/8AA.11

(dimensions in mm)

**Version with 2 nickel-plated steel radial tabs
featuring 2 prongs on + side and 1 prong on - side**



Positive end



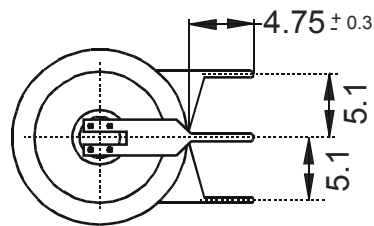
Negative end

LST 14250 3PF RP

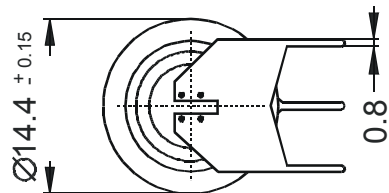
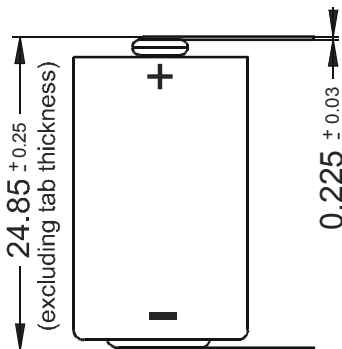
P/N T04/8AA.9

(dimensions in mm)

**Version with 2 nickel-plated steel radial tabs
featuring 2 prongs on – side and 1 prong on + side**



Positive end



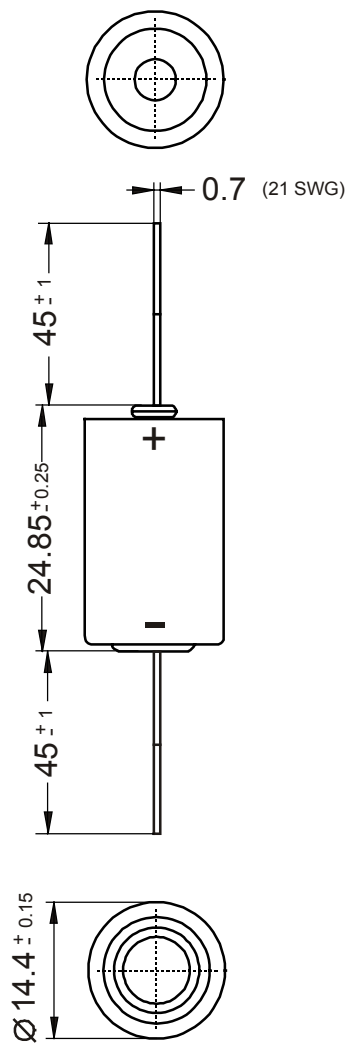
Negative end

LST 14250 CNA

P/N T04/8AA.8

(dimensions in mm)

Version with 2 tinned-copper axial leads

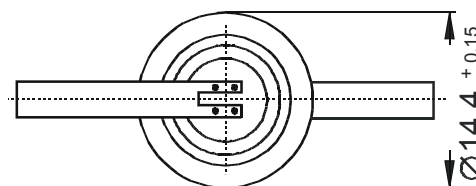
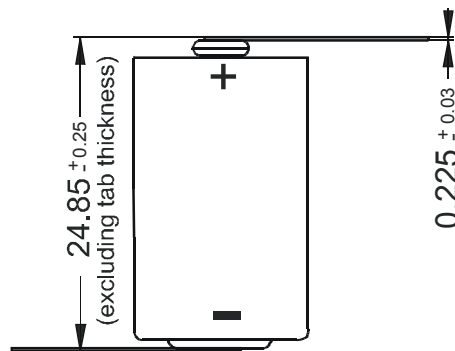
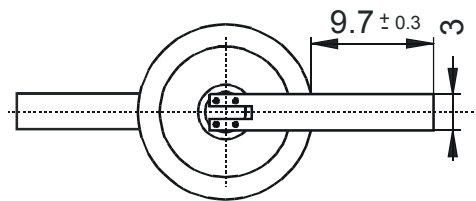


LST 14250 CNR OP

P/N T04/8AA.2

(dimensions in mm)

Version with 2 rectangular nickel-plated steel radial tabs running in opposite directions





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