

# Material Safety Data Sheet Compliance Certificate

## Rubidium Oscillator



### Oscillator details

Type : Rubidium  
Manufacturer : Microsemi  
Model Number : SA.35m or SA.31m  
CAS Number : 7440-17-7

### Exposure

The oscillator components covered under this certification contains minimal amounts of Rubidium. The Rubidium is sealed in a glass chamber within the internal components of the device. The risk of exposure to rubidium is minimal, due to the design and intended use of each device, and the amount of rubidium contained within each product.

### Disposal

The oscillator must be disposed of in accordance with all state and federal laws.

### Shipping

All Microsemi's Rubidium electronic components used in our timing products are safe to be shipped both domestically and internationally as a non-hazardous product. It has been certified by the United States Department of Transportation (US DOT) Ref. No. 08-0154 and the International Air Transport Association (IATA) that Microsemi's Rubidium components contained in this product are not considered a hazardous class 4 material in transportation.

### Further information

All information provided in this MSDS is accurate, to the best of Tekron's knowledge, as of the date this certification was issued. For further information the Microsemi Material Safety Data sheet should be consulted.

**Timing and Frequency Products with Base Model Numbers:**

▪ X72 ▪ SA.22c ▪ LPRO ▪ SLPRO ▪ XPRO ▪ LN72 ▪ SALN ▪ SA.31m ▪ SA.33m ▪ SA.35m

**SDA Group Numbers:**

▪ 8123 ▪ 8130 ▪ 8200

SDS Issue Date: April 2<sup>nd</sup>, 2015  
 SDS Review Date: April 1<sup>st</sup>, 2015

**1. CHEMICAL PRODUCT IDENTIFICATION**

Product Type	CAS #	Molecular Weight
This MSDS Applies to: timing or frequency reference products containing Rubidium with the following Base Model numbers: <b>X72; SA.22c; LPRO; SLPRO; XPRO; LN72; SALN; SA.31m; SA.33m; SA.35m</b> and SDA Group numbers: <b>8123; 8130; 8200</b>	7440-17-7	85.47
Manufacturer / Supplier		
Microsemi Inc. 34 Tozer Road Beverly, MA 01915		Tel. (978) 927-8220 Fax. (978) 927-4099

**2. HAZARDS IDENTIFICATION**
**Labels:**


GHS02 Flame



GHS05 Corrosion

**Signal Word:**
**DANGER**
**Hazard Statements:**

H260 – In contact with water releases flammable gases which may ignite spontaneously

H314 – Causes severe skin burns and eye damage

**Precautionary Statements:**

P231+P232 – Handle under inert gas. Protect from moisture

P260 – Do not breathe dust/fumes/gas/mist/vapours/spray

P303+P361+P353 – IF ON SKIN(or hair): Remove/take off immediately all contaminated clothing. Rinse Skin with water/shower.

P305+P351+P338 – IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P405 – Store locked up

P501 – Dispose of contents/container in accordance with local / state / national / international regulations

**GHS Classification System:**

Substances, which in contact with water, emit flammable gases--- Category 1

Skin corrosion--- Category 1B

Serious eye damage--- Category 1

NFPA-ratings (scale 0-4)		HMIS-ratings (scale 0-4)	
Health	2	Health	3
Fire	3	Fire	3
Reactivity	3	Reactivity	3
Special Hazard	Water-Reactive		

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SDS Issue Date: April 2<sup>nd</sup>, 2015SDS Review Date: April 1<sup>st</sup>, 2015**3. COMPOSITION / DATA ON COMPONENTS****Hazardous Component**

7440-17-7 | Rubidium | 0-100%

**4. FIRST AID MEASURES**

Inhalation:	Remove the victim to fresh air and seek medical attention if coughing, shortness of breath or irritation persists.
Skin contact:	Wash the affected area with soap and water for at least 15 minutes. Remove contaminated clothing. Seek medical assistance if irritation persists.
Eye contact:	In case of contact immediately flush the eyes with water for at least 15 minutes. A victim may need assistance in keeping their eyelids open. Get immediate medical attention.
Ingestion:	Seek medical attention immediately. Keep the victim calm. Give the victim water (only if conscious). Induce vomiting only if directed by medical personnel.

**5. FIRE FIGHTING MEASURES****Suitable extinguishing agents:**

Graphite, soda ash, powdered sodium chloride, sand, or suitable dry powder. "DO NOT USE WATER OR CARBON DIOXIDE". Firefighters must wear NIOSH approved positive pressure self-contained breathing apparatus and fully protective impervious suit.

**Unusual fire and explosion hazards:**

DANGEROUS WHEN WET. Reacts with water, moisture or steam to form flammable and explosive hydrogen gas. Dangerous fire and explosion hazard when exposed to heat, a flame, or by chemical reaction with oxidizing agents. Ignites on contact with air, oxygen and halogens. May react with mercury, phosphorous, non-metals, vanadium chloride, oxides, and acids. Explodes in contact with liquid Bromine. When heated to decomposition rubidium metal may emit toxic fumes of Rb<sub>2</sub>O.

**6. ACCIDENTAL RELEASE MEASURES**

The material will ignite spontaneously in air. Burning material may release toxic fumes. Leave the area unless fitted with a self-contained breathing apparatus. Smother fire with dry powder. Do not use water. Keep sparks, flames, and other sources of ignition away. Keep material out of water sources and sewers. Do not attempt to sweep up dry material.

**7. HANDLING AND STORAGE**

Handle under a dry protective gas such as nitrogen or argon. Keep container tightly sealed. Store in a cool, dry place in tightly closed containers. Ensure good ventilation at the workplace. Store away from water / moisture. Store away from oxidizing agents. Do not store together with acids. Store away from halogens.

**8. EXPOSURE CONTROLS AND PERSONAL PROTECTION**

7440-17-7	Rubidium
There has not been an exposure limit established by OSHA (PEL), NIOSH (REL), or ACGIH (TLV) for Rubidium.	
<b>Personal Protective Equipment:</b>	
Respiratory Protection:	Wear a NIOSH/MSHA approved respirator
Hand Protection:	Rubber gloves
Eye Protection:	Always wear approved chemical splash proof goggles.
Other Protective Equipment:	Protective work clothing.

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SDS Issue Date: April 2<sup>nd</sup>, 2015  
SDS Review Date: April 1<sup>st</sup>, 2015**9. PHYSICAL AND CHEMICAL PROPERTIES**

Boiling Point:	688°C
Melting Point:	38.9°C
Specific Gravity:	1.532 g/cc
Vapor Pressure:	No data
Solubility in H <sub>2</sub> O:	Reacts violently with water.
% Volatile:	No data
Appearance and Odor:	Silver-white solid, no odor.

**10. STABILITY AND REACTIVITY**

Stability:	Moisture sensitive, pyrophoric.
Conditions to Avoid:	Contact with water or air.
Incompatibility (Materials to Avoid):	Water, alcohols, oxidizers, oxygen, carbon dioxide, halogens, halocarbons, acids.
Hazardous Decomposition Products:	Flammable hydrogen with moisture, caustic oxide with air.
Hazardous Polymerization:	No hazardous polymerization.

**11. TOXICOLOGICAL INFORMATION**

Devices covered under this MSDS contain minimal amounts of Rubidium. The Rubidium containing components are sealed in a glass chamber within the internal components of the device. The risk of exposure to rubidium is minimal, due to the design and intended use of each device and the amount of rubidium contained within each product. This section outlines the potential effects of exposure should exposure to Rubidium occur.

The toxicological effects of Rubidium have not been fully researched. The human body tends to concentrate Rubidium in the body's electrolytic fluid. The ions are not known to be particularly toxic, and are relatively quickly removed in the sweat and urine. It has been indicated that overexposure could potentially lead to muscle and red blood cell accumulation with possible neuromuscular effects, hyper irritability and muscle spasms.

Rubidium reacts with moisture readily to form rubidium hydroxide which is highly corrosive to tissue. Rubidium hydroxide is acutely destructive to tissues. Contact with the eyes may result in permanent damage and complete or partial vision loss. Inhalation may damage the respiratory tract; effects may include: inflammation, edema, chemical pneumonitis, coughing, wheezing, laryngitis, shortness of breath, headache nausea and vomiting. Exposure to skin may result in severe burns or irritation.

**Acute Effects**

<b>Skin:</b>	May cause severe thermal burns, corrosion and ulceration of the skin may occur with direct contact.
<b>Eye:</b>	May cause severe thermal burns, corrosion and ulceration of the eye may occur with direct contact.
<b>Ingestion:</b>	Not a likely mode of entry; may cause burns and perforations of gastrointestinal tract.
<b>Inhalation:</b>	Not a likely mode of entry; may cause inflammation, edema, chemical pneumonitis, coughing, wheezing, laryngitis, shortness of breath, headache nausea and vomiting

**12. ECOLOGICAL INFORMATION**

Do not allow product to enter water sources or sewers.

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*SDS Issue Date: April 2<sup>nd</sup>, 2015*  
*SDS Review Date: April 1<sup>st</sup>, 2015***13. DISPOSAL CONSIDERATIONS**

Material should be disposed of in accordance with local, state, and federal regulations.

**14. TRANSPORT INFORMATION**

All Microsemi's Rubidium products can be shipped both domestically and internationally as a non-hazardous product. Microsemi has received letters of interpretation from both the United States Department Of Transportation(US DOT) Ref. No. 08-0154 and the International Air Transport Association(IATA) stating the Microsemi's Rubidium products are not considered a hazardous class 4 material in transpotation.

**15. REGULATIONS**

<b>Regulation</b>	<b>Status</b>
SARA (Superfund Amendments and Reauthorization Act)	Not Listed
TSCA (Toxic Substances Control Act)	Not Listed
CERCLA (Comprehensive Environmental Response, Compensation, and Liability Act of 1980)	Not Listed
EPCRA (Emergency Planning and Community Right to Know Act)	Not Listed
RCRA (Resource Conservation and Recovery Act)	Not Listed

**16. OTHER INFORMATION**

The information contained herein is based on data considered accurate and is offered solely for information, consideration and investigation. Symmetricom shall not be held liable for any damage resulting from handling or from contact with the above product.