



Space-Qualified SAW Devices:

Phonon has been producing an extensive legacy of space-qualified SAW devices since 1987. All products are built to each customer's individual requirements. Products can be built for either commercial or military space applications. Our space-qualified products are all built to MIL-PRF-38534 Class K reliability.

Space-Qualified SAW Oscillators: SAW based oscillators offer better phase noise performance at higher fundamental frequencies of 300MHz to 2.5 GHz. Phonon's oscillators feature micro-oven designs which greatly improve frequency stability over temperature while using a minimal amount of power. Aging Stability is very small with a typical performance of 20 ppm over 20 years.

Space-Qualified SAW Filters: These devices are ideal for space applications due to their small size and excellent durability. Full MIL-STD-883 qualification standards are available. Phonon Engineering has great design flexibility due to the ability to synthesize any finite impulse response. Designs are available from a wide range of 20 MHz to 2.5 GHz. Bandwidths are available from .1% to 50% of frequency. Internal matching capability is available if desired.

Space-Qualified SAW Integrated Module Assemblies (IMAs): These are also known as modules or sub-systems. The most complex of Phonon's product offerings, modules combine SAW components with additions like amplifiers, mixers, detectors, and more. Each module configuration is custom-designed to meet the customer's desired performance capabilities. A sub-system is in turn made up of multiple modules. Examples of types of modules Phonon has produced include unity gain, ovenized, switched filter, channelized filter, and pulse compression.

Phonon has delivered space-qualified SAW products to the following prominent customers:

- Thales Alenia Space
- Space Systems Loral
- Boeing Corporation
- Selex-ES
- Harris Corporation
- Raytheon
- Frequency Electronics
- JPL
- Northrop Grumman

About Phonon

Phonon is owned and managed by engineers. We welcome engineering challenges and take pride in our engineering accomplishments. Our products are high-end, high-performance and at the cutting edge of SAW technology. **Our customers pay fixed-price for non-recurring product development engineering, never cost plus, and we never quit until our customer is satisfied - a core principle.**

SAW design, analysis and system modeling using proprietary software is a special strength, as is circuit and mechanical design using the latest EDA tools. We preliminary design and model a new SAW product, and provide an s-parameter file, at proposal time.

Manufacturing processes and equipment receive significant continuous engineering attention for custom automation and yield & thru-put improvement.

Each product is fully screened and tested over temperature using custom test software to operate test equipment and generate a completed deliverable Acceptance Test Data Sheet.