Rakon is a world leader in the development of frequency control solutions for a wide range of applications. Rakon has leading market positions in the supply of crystal oscillators to the GPS, telecommunications network timing/ synchronisation, and aerospace markets.

Founded in New Zealand in 1967 by Warren Robinson, Rakon became the leading supplier of GPS TCXOs to the world market in 1991. Since then the GPS market has evolved from low volume niche applications to a high volume consumer based market. Rakon has maintained market dominance, and has excelled in taking high precision, niche technology and transforming this into high volume cost effective solutions, while still maintaining the highest performance and quality. This leadership has been achieved through unique proprietary processes, continual innovation, expert consultation and constant technology advancement.

Rakon became a publicly listed company on the New Zealand Stock Exchange in May 2006. In March 2007 Rakon acquired the Frequency Control Products (FCP) division of C-MAC MicroTechnology, and established itself as a leader in frequency control for the expanding timing and synchronisation, wireless and base station markets. The European based FCP division of C-MAC has an impressive history dating back to 1937.

Today Rakon has a diverse product portfolio ranging from low stability XO, VCXO and crystal products, through to high volume precision TCXOs and all the way to precision OCXO and Rubidium equivalent frequency standards. A large multinational, Rakon has operations in New Zealand, the UK, France, China, Taiwan, Japan and the U.S.A.

Core Competencies

Superior customer solutions

With frequency control solution design centres in the UK, France and New Zealand, Rakon provides solutions for the world's frequency requirements.

Rakon is well aware that customer designs require individual solutions. Continuous expert consultation is available from initial concept and prototype through to the finished product, and is ongoing throughout the product's life cycle. Rakon has strong relationships with its customers - some dating back over 30 years. Through acute technical understanding Rakon enables partners concepts to become a reality, working from the initial idea through to development of a customised solution.

A global sales presence

Rakon has extensive customer support world-wide, with offices in New Zealand, the U.S.A, the U.K, France, China, Taiwan and Japan. Rakon also maintains a network of over 40 manufacturing representatives and distributors worldwide.

World-wide manufacturing and distribution

Rakon has a global manufacturing model with plants located in New Zealand, Europe and Asia.

Performance and precision in the extreme

Rakon's products meet the industry's intensifying need for high levels of accuracy and stability in extreme and dynamic conditions. Rakon pioneered the development of oscillators capable of maintaining high levels of accuracy and unique lock on stability under extreme environmental conditions.

Rakon is synonymous with reliability

Rakon has world leading quality assurance practices. Corrective action processes have been compared with the NASA equivalent. Rakon's reputation for quality has been established from Rakon's long history of delivering the most reliable products in the industry.

World leading technology

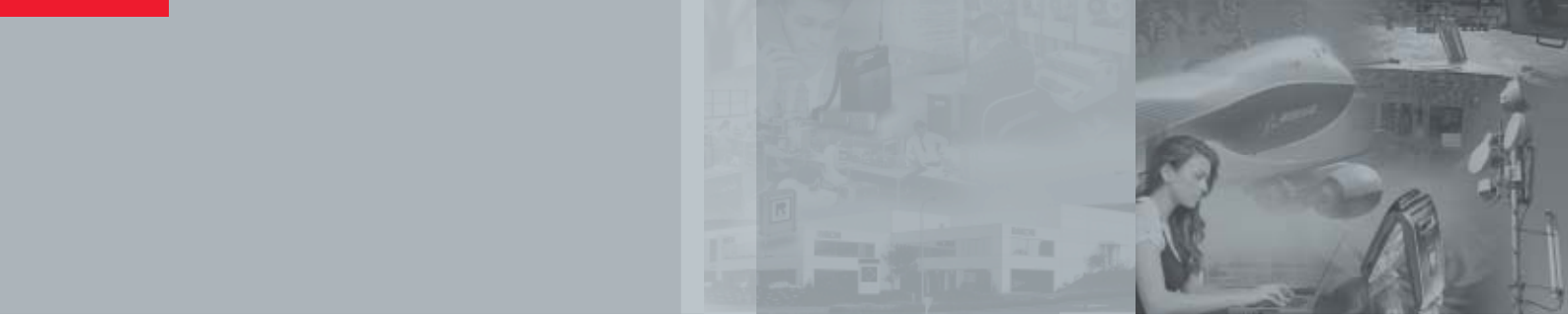
Rakon has developed unique advanced testing and compensation technology. Stabilities achieved in its 3G test system units are up to 5 times better than competitive technologies.

Rakon is the only crystal and oscillator manufacturer that has the technology to provide 100 percent high temperature resolution screening of high volume production to ensure that all non-performing crystals and oscillators are eliminated.

Innovative products

Rakon products are continuously evolving. The culture at Rakon is innovative, fast paced and vibrant as new challenges open up new avenues for improvement and creativity. Rakon continues to lead the way with the development of new generation oscillators for optimising customer performance.

Rakon - leading the way, enabling connectivity everywhere.



GLOBAL PRESENCE

Durham, NC, USA
Customer support office for North America.
NORTH AMERICA

Lincoln/Harlow, UK
Design and manufacturing of Pluto based TCXOs and Advanced Technology Products.
EUROPE

Crewkerne, UK
European sales and support, as well as logistics management for commodity products.
EUROPE

Osaka, Japan
Consultancy office for Japanese business.
ASIA/PACIFIC

Shenzhen, China
Customer and technical support for mainland China.
ASIA/PACIFIC

Argenteuil, France
Sales, support, design and manufacturing of SC Crystal and OCXOs.
EUROPE

Chicago, IL, USA
Primary customer and technical support office for North America.
NORTH AMERICA

India
Subcontracted manufacturing for legacy products formally manufactured in Harlow, UK.
ASIA/PACIFIC

Taipei, Taiwan
Customer and technical support for Taiwan, Korea and SE Asia.
ASIA/PACIFIC

Auckland, New Zealand
Head office, sales, technical support, design and manufacturing of high precision crystals & TCXOs.
ASIA/PACIFIC

750	Staff
5	Manufacturing plants
4	Sales offices
38	Rep offices
12	Distributors

RAKON

RAKON AT A GLANCE

Quartz crystals are found in nearly all electronic devices, from high-tech aerospace applications through to TVs and wrist watches. Quartz crystals are used in electronic devices to act as a timing or frequency reference device to ensure the functionality of electronic equipment dependent upon accurate timing or frequency control.

An oscillator is an electronic circuit that is used for the purpose of generating a repetitive electronic signal.

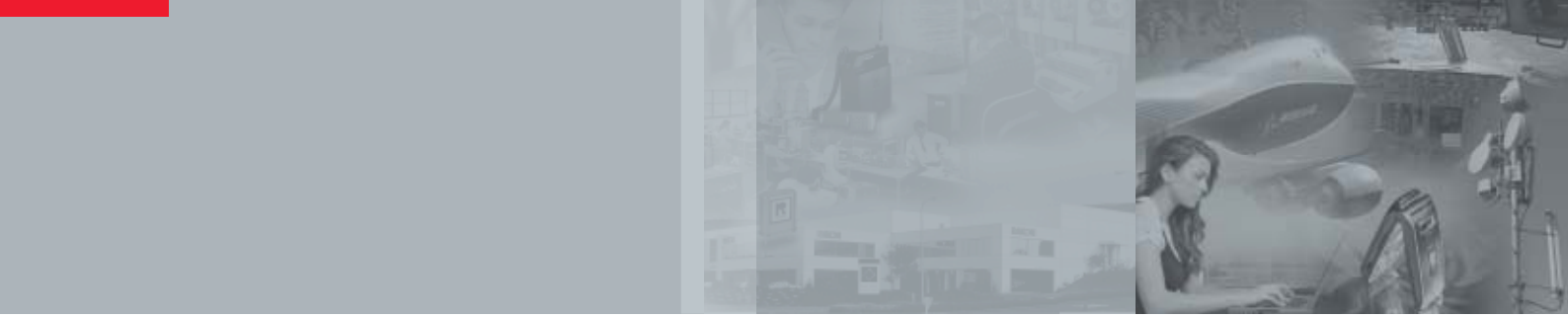
A crystal oscillator is an electronic circuit that uses the mechanical resonance of a vibrating crystal of piezoelectric material to create an electrical signal with a very precise frequency. This frequency is commonly used to keep track of time (such as in quartz wristwatches). The simplest crystal oscillators require an amplifier and feedback in the circuit along with the crystal.

OVEN CONTROLLED CRYSTAL OSCILLATORS (OCXOs)
OCXOs eliminate the effect of temperature on frequency by maintaining the oscillator at a constant temperature above ambient. The crystal is enclosed in a small insulated container along with a heating element and a temperature sensor. This arrangement keeps the crystal at a constant temperature regardless of the temperature of the environment outside the OCXO.

OCXOs offer very high performance and accuracies and are typically used in mission critical applications. Because of the larger size and power requirements of OCXOs they are typically only used in fixed applications such as cell towers, telecommunication switches and satellites.

Through years of development and optimisation of electronic circuitry and crystal design, Rakon offers a world leading range of OCXO products with unparalleled performance.

Rakon has a complete range of precision solutions from OCXOs capable of replacing expensive Rubidium clocks in SDH/SONET Stratum 2 applications through to low profile oven oscillator products. Rakon's self calibrating OCXOs can maintain stabilities of better than 16ppb (1.6×10^{-8}) over the product's entire life time and can achieve stabilities of less than 0.05ppb (5×10^{-11}) over temperature. Other OCXO products include high precision, low phase noise and low profile ovens. Rakon specialises in delivering customised solutions to suit a wide variety of applications including network timing & synchronisation, base stations, telecoms infrastructure and even space qualified requirements.



TEMPERATURE COMPENSATED CRYSTAL OSCILLATORS (TCXOs)

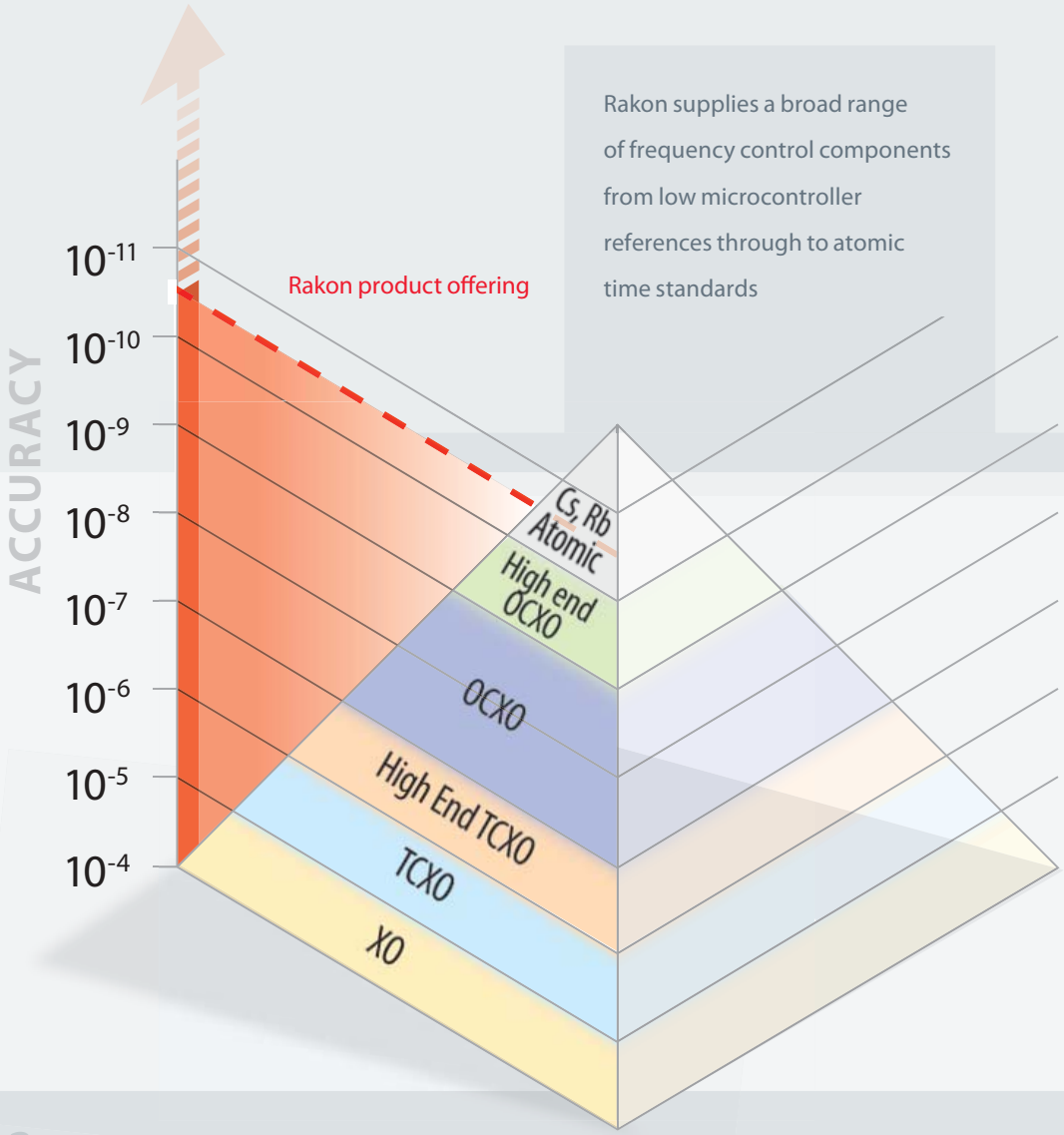
TCXOs provide another way of creating stability in a quartz crystal's oscillating frequency over a temperature range, by applying a correction voltage to the circuit to stabilise its frequency output as temperature changes. This voltage is based on an output signal received from a temperature sensor, placed near the crystal.

TCXOs can be used in a myriad of applications including telecommunications, microwave and GPS, where high levels of accuracy can be achieved in applications where small size is critical.

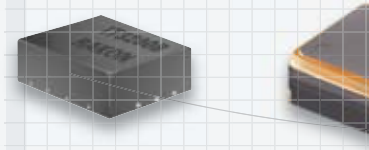
ULTRA STABLE TEMPERATURE COMPENSATED CRYSTAL OSCILLATORS

Rakon's ultra stable TCXO products offer the highest frequency stability performance achievable from a TCXO. These TCXOs address markets that require near OCXO performance, but without the high cost or power consumption. The Triton™ product family combines proprietary ASIC compensation technology with simplified oven control to create a hybrid product capable of stabilities down to 25ppb (2.5×10^{-8}) over temperature, in small DIP14 packages. The Pluto™ and Barracuda™ TCXO product families fulfil the requirements of demanding communications and precision GPS markets. With stabilities as tight as 100ppb (1×10^{-7}) over temperature and a variety of output options, these products are ideal for wireless home base stations, rescue beacons and other high volume, stability demanding applications.

The Pluto family are the only products in the world to address the often ignored problem of voltage control tilt in VCTCXO devices.



Rakon supplies a broad range of frequency control components from low microcontroller references through to atomic time standards



HIGH STABILITY TEMPERATURE COMPENSATED CRYSTAL OSCILLATORS

Rakon has developed a range of high stability TCXO products for mass volume consumer applications. These products have become the default standard for consumer GPS and other performance critical volume applications. These products come in a variety of form factors, from the larger 7.0 x 5.0 mm footprint through to miniature 2.5 x 2.0 mm packages. All offer high stability (<0.5ppm) over demanding temperature ranges and very low frequency slope (ppb/°C) at highly competitive costs.

PRECISION QUARTZ CRYSTALS

Rakon has over 40 years experience in crystal design and today manufactures a range of AT, Y and SC cut crystals in a variety of industry standard and ultra miniature SMD package sizes. Rakon's patented HiG™ crystals can withstand shocks of greater than 20,000G and are extremely resistant to frequency noise induced by vibration.

SPECIALTY PRODUCTS

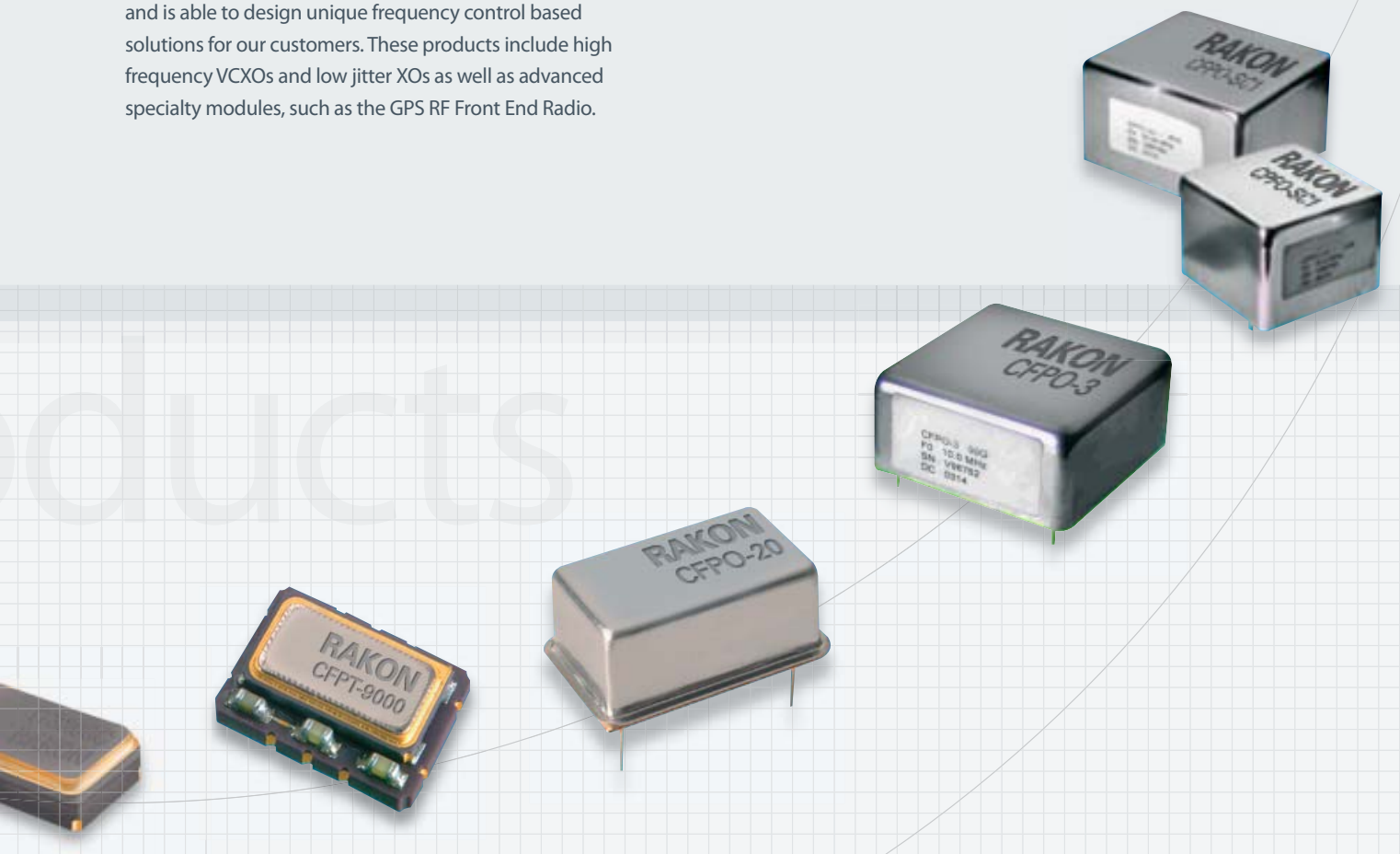
Rakon manufactures a range of application specific products and is able to design unique frequency control based solutions for our customers. These products include high frequency VCXOs and low jitter XOs as well as advanced specialty modules, such as the GPS RF Front End Radio.

The GPS RF Front End Radio Module is the world's smallest GPS Radio. As a more complete RF solution, test time and design time are virtually eliminated. Designed to interface with software processing solutions it is a cost neutral, fast turn around solution for GPS hardware designers.

Rakon's temperature sensing crystal oscillators also offer system designers the ability to achieve extremely stable frequency solutions from miniature, power efficient products.

COMMODITY PRODUCTS

As a complete frequency control solutions provider, Rakon has a range of frequency control products to address the commodity market. These products are Rakon quality assured and manufactured by approved subcontractors and partners. Typically XOs are low cost, low performance oscillators where lower accuracies are required such as wristwatches, TVs and microprocessor clocks. By intelligent management and understanding of the frequency control supply chain, Rakon offers cost effective solutions for low end XO, VCXO and quartz crystal requirements.



AVIATION

The aviation community is using GPS extensively. With its accurate, continuous all-weather coverage, satellite navigation offers a navigation service that satisfies many of the requirements of users worldwide.

Technology is continually advancing, with the development of automatic landing and take off systems being a reality in the future.

WIMAX

WiMax aims to provide high speed wireless data over long distances, in a variety of different ways, from point to point links to full mobile cellular type access. For individual services 3G and Wimax can compete with each other.

3G

3G is the next generation of mobile phone technology. It offers users a wide range of high speed mobile services, including voice telephony and broadband wireless data.

Sales of 3G phones may hit 392 million units this year and show an approximately 40 percent compounded annual growth rate from 2007 through 2010.

PERSONAL NAVIGATION DEVICES (PND)

A PND is a portable electronic product which combines a positioning capability (such as GPS) and navigation functions. The term has come into widespread use with the growing popularity of after market navigation devices for automobiles.

Sales of PNDs in North America and Europe grew to 13 million units in 2006, up from 5 million units the year before. Most analysts predict volumes will continue to ramp strongly again through 2008.

EXAMPLES OF USER APPLICATIONS

EMERGENCY BEACONS

Beacons allow people in distress to be located by emergency services. Since 1982, 20 300 people have been rescued worldwide.
Over 800,000 emergency beacons are currently in use. New requirements for emergency beacons are coming into effect.

FEMTOCELLS

Femtocells are very small 3G cellular base stations designed for use in people's home or office. Femtocells provide a variety of services including home phone line, broadband and other media services.
"the market for femtocells is predicted to rise to at least $2bn by 2011." (source: Stuart Carslaw, ABI Research, April 07).

BASE STATIONS

Fixed antennas used for wireless telecommunications. A base station consists of one or more radio transmitters and receivers that communicate with individual mobile phones in the area.

RAKON

LEADING THE WAY
ENABLING CONNECTIVITY EVERYWHERE