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CRYSTAL OSCILLATOR MARKET

By General Circuitry (SPXO, TCXO, VCXO, FCXO, & OCXO), Technology (AT, BT, SC), Mounting Scheme (SMT and Thru-Hole), Application (Telecom, Consumer, Industrial, Automotive, and Medical) and Geography

GLOBAL FORECASTS TO 2020

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1 INTRODUCTION

1.1 OBJECTIVES OF THE STUDY

- To define, describe, and forecast the crystal oscillator market on the basis of general circuitry, applications, technologies, mounting schemes, and geography
- To provide detailed information regarding major factors influencing the growth of the market (drivers, restraints, opportunities, industry-specific challenges, winning imperatives, and burning issues)
- To strategically analyze the micro-markets with respect to the individual growth trends, future prospects, and contribution to the total market
- To analyze opportunities in the market for stakeholders and details of the competitive landscape for the market leaders
- To forecast the value of market segments with respect to the main geographic regions, namely North America, Europe, Asia-Pacific, and Rest of the World (RoW)
- To strategically profile key players and comprehensively analyze their market shares and core competencies
- To track and analyze competitive developments such as joint ventures, mergers and acquisitions, new product developments, and research and developments in the crystal oscillator market

1.2 MARKET DEFINITION

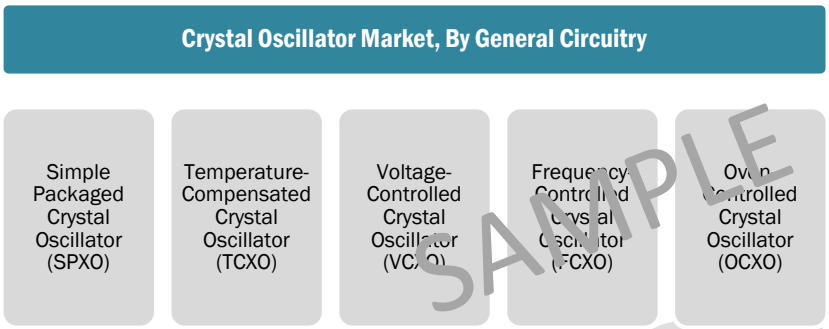
Crystal oscillator market is now matured with the oscillators finding numerous applications in various segments such as consumer electronics industry, network industry, wire and wireless communication industry, aerospace and military, and electronic components industry. Although there are substitutes for crystal oscillators such as silicon timing devices, dielectric resonance oscillators, Film Bulk Acoustic Resonator (FBAR), and the MEMS technology, none of them currently come even close to giving a fierce competition to crystal oscillators.

1.3 STUDY SCOPE

1.3.1 MARKETS COVERED

This report categorizes the crystal oscillator market into the following segments:

Global crystal oscillator market, by general circuitry



Temperature-Compensated Crystal Oscillator (TCXO)

- Voltage-Controlled Temperature-Compensated Crystal Oscillator (VCTCXO)

Voltage-Controlled Crystal Oscillator (VCXO)

- Temperature-Compensated Voltage-Controlled Crystal Oscillator (TCVCXO)
- Oven-Controlled Voltage-Controlled Crystal Oscillator (OCVCXO)

Oven-Controlled Crystal Oscillator (OCXO)

- Double Oven Controlled Crystal Oscillator (DOCXO)
- Evacuated Miniature Crystal Oscillator (EMXO)

Global crystal oscillator market, by application

- Telecom and Networking
- Consumer Electronics
- Military and Aerospace
- Research and Measurement
- Industrial
- Automotive
- Medical Equipment

Global crystal oscillator market, by technology

- AT Cut
- SC Cut
- BT Cut

Global crystal oscillator market, by mounting scheme

- Surface Mount
- Thru-hole

1.3.2 GEOGRAPHIC SCOPE

- North America
- Europe
- Asia-Pacific
- Japan
- RoW

1.3.3 YEARS CONSIDERED FOR THE STUDY

- Historical year - 2012
- Base year - 2013
- Forecast years – 2014 to 2020
- Base year used for company profiles was 2013. Where the information was not available for the base year, the prior year has been considered

1.4 CURRENCY

The currency used in the report is the U.S. dollars, with market size indicated in $million

- For companies reporting their revenue in the U.S. dollars, the revenue was picked from their annual reports
- For companies that reported their revenue in other currencies, the average annual currency exchange rate has been used for the particular year to convert the value into the U.S. dollars

1.5 STAKEHOLDERS

- Raw material vendors
- Electronic design automation and design tool vendors
- Fabrication, wafer, and foundry process equipment vendors
- Integrated device manufacturers
- Fabrication players
- Intellectual property vendors
- Original Device Manufacturers (ODMs) (crystal oscillator and component manufacturers)
- Original Equipment Manufacturers (OEMs) – electronic modules, devices, equipment, instruments, and system manufacturers
- Assembly, testing, and packaging vendors
- Crystal oscillator traders and distributors
- Research organizations

2 EXECUTIVE SUMMARY

Crystal oscillators have a significant position across different industry verticals such as telecom and networking, consumer electronics, military and aerospace, research and measurement, industrial, automotive, and medical equipment. The two major applications of crystal oscillators are the consumer electronics as well as telecom and networking industries. These applications together accounted for XX% of the total crystal oscillator market in 2013. The deployment of 3G and 4G networks have gained pace off late with the evolution of the LTE standard. This has been one of the key drivers for the high demand of oscillators in the telecom industry. Most of the regions in North America are already a part of this network coverage, while the developing countries such as China and India are speeding up and expected to see a large scale deployment of 3G and 4G over the next five years. Other applications which are expected to drive this market in the coming years are the military and aerospace, automotive, and medical equipment sectors.

The demand for reliable, high performance, and low cost crystal oscillators is increasing and leading to the development of new technologies such as the micro-technology and nano-technology offering opportunities such as miniaturization, low power consumption, mass production, and so on. The evolution of the Quartz MEMS technology is an important step in this direction. Not only has it led to miniaturization and energy saving, but has also provided advantages such as high degree of stability and accuracy. The integration of various components into one module has resulted in the simplification of the development process and significant reduction in the development costs. There are many crystal cuts used in crystal oscillators such as the AT cut, BT cut, SC cut, and many more. However, the AT cut is the most preferred crystal cut by the industry because of its higher frequency range, that is, 0.5-300 MHz.

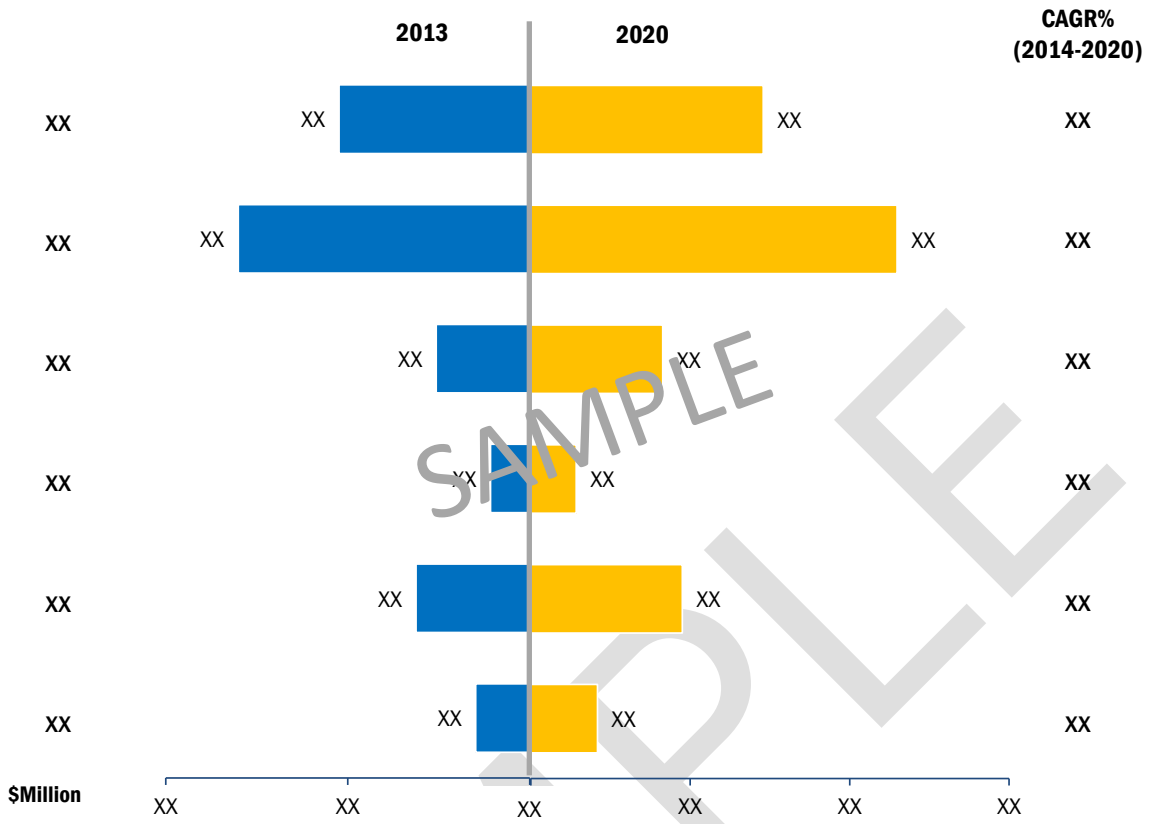
With most of the consumer electronics manufacturers based in APAC, the crystal oscillator market in this region is expected to grow at the fastest rate, owing to the huge demand for consumer electronic products such as smartphones, laptops, and computers. Moreover, APAC, especially China and India, will witness a large scale deployment of 3G and 4G infrastructure during the next three to five years, which is expected to further drive the market for crystal oscillators in this region. The top companies in this market include Miyazaki Epson Corporation (Japan) and Nihon Dempa Kogyo Co., Ltd. (NDK) (Japan).

The market leader of the crystal oscillator market is the Japanese company, Miyazaki Epson Corporation. The company offers communication systems, industrial electronics, radio communication systems, crystal devices, crystal unit/resonators, crystal oscillators, real-time clock modules, filters, and sensors. Another top company is Nihon Dempa Kogyo Co., Ltd. (Japan), which has a wide geographical presence with 18 sales bases and 8 manufacturing plants around the world.

SPXO and TCXO are the two most widely used crystal oscillators in all industry verticals, especially in telecom and networking as well as consumer electronics. SPXOs and TCXOs have together captured a market share of ~XX% of the total crystal oscillator market in 2013. Nowadays, the surface mount crystal oscillators are preferred the most because they have advantages such as low production cost and higher component density. There are a large number of well-established players in the crystal oscillator market with each player specializing specific types of oscillators. The existing industry giants who occupy dominant shares in the market face a considerable degree of competition with increasing R&D investments and a huge focus on developing unique solutions to stay in the competitive race.

The crystal oscillator market was valued at $XX million in 2013 and is estimated to reach $XX million by 2020, at an estimated CAGR of XX% from 2014 to 2020. In terms of unit shipment, the total number of crystal oscillators shipped in 2013 was XX million units, which is estimated to reach XX million units by 2020, at a CAGR of XX% from 2014 to 2020.

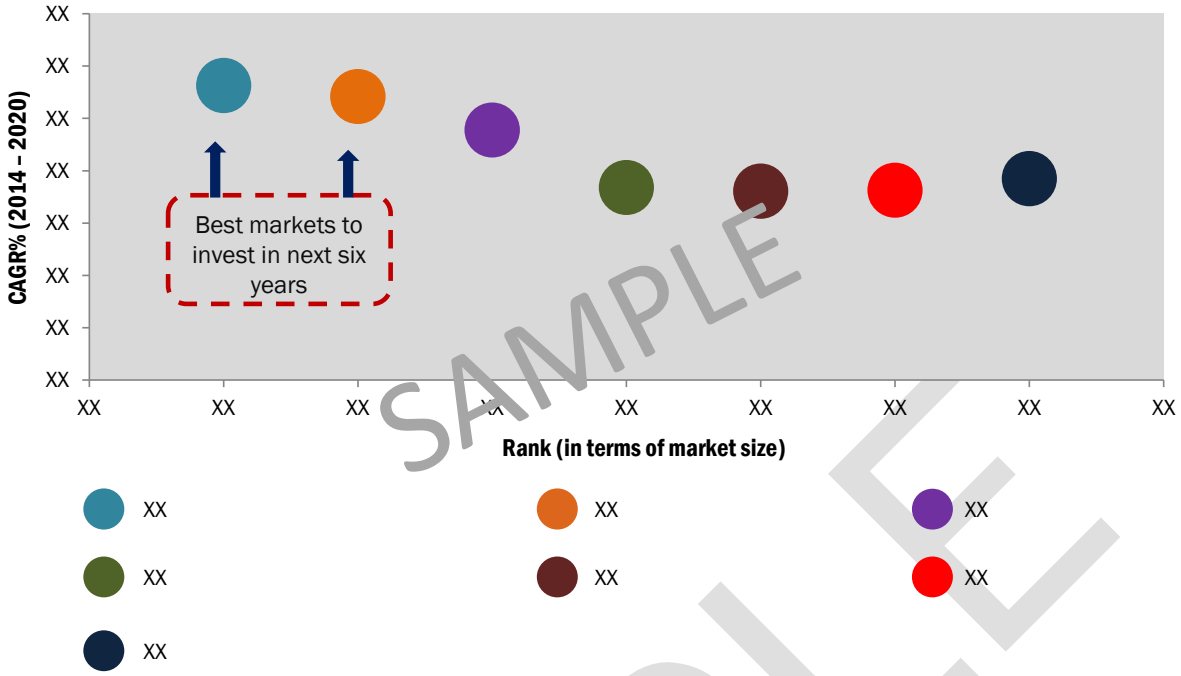
FIGURE 1 CRYSTAL OSCILLATOR MARKET SIZE, BY GENERAL CIRCUITRY, SNAPSHOT (2013 VS 2020) ($MILLION)



Source: Annual Reports, SEC Filings, Press Releases, Magazines, Investor Presentations, Expert Interviews, and MarketsandMarkets Analysis

The overall market size of crystal oscillators in 2013 was valued at $XX million, which is expected to reach $XX million by 2020, at a CAGR of XX% from 2014 to 2020. The TCXO market was valued at $XX million in 2013, which is expected to reach $XX million by 2020, at the CAGR of XX% from 2014 to 2020. There is a huge demand for TCXOs in telecom and networking as well as consumer electronics products such as smartphones and tablets; thus, the TXCO segment has grown rapidly in the crystal oscillator market.

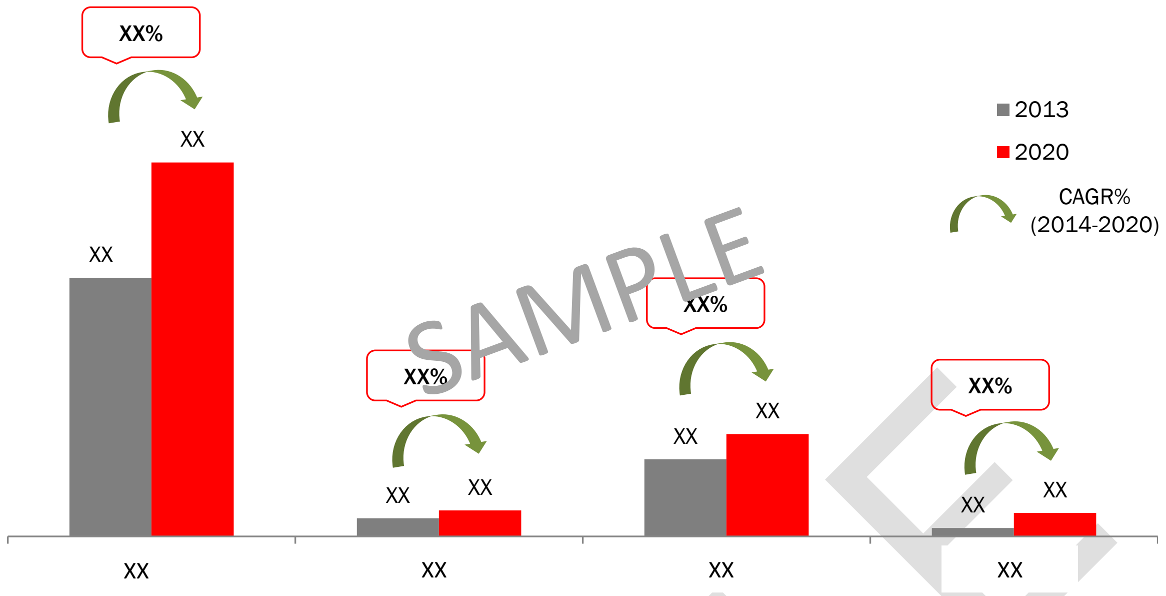
FIGURE 2 CRYSTAL OSCILLATOR MARKET, BY APPLICATION, 2013



Source: Annual Reports, SEC Filings, Press Releases, Magazines, Investor Presentations, Expert Interviews, and MarketsandMarkets Analysis

The crystal oscillator market in the consumer electronics sector was valued at $XX million in 2013; this is expected to reach $XX million by 2020 at a CAGR of XX% from 2014 to 2020. Crystal oscillators are used for applications in 3G communication, mobile communication equipment, wireless base station, Global Positioning System (GPS), instruments and meters with high precision, electricity measure equipment, specialized network, military radio stations, radar equipment, remote sensing, and more. Thus, the crystal oscillator market has grown rapidly, especially in the consumer electronics segment.

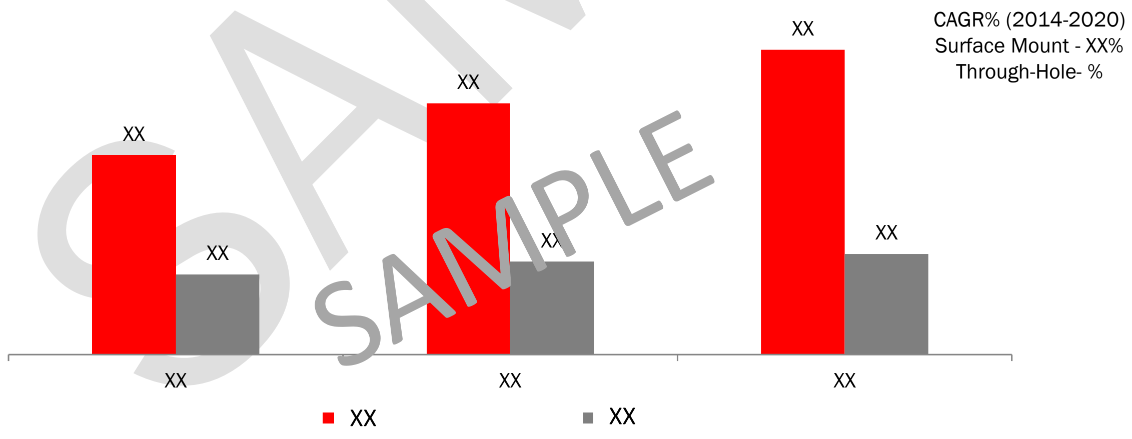
FIGURE 3 CRYSTAL OSCILLATOR MARKET SIZE, BY TECHNOLOGY, 2013 - 2020 ($MILLION)



Source: Annual Reports, SEC Filings, Press Releases, Magazines, Investor Presentations, Expert Interviews, and MarketsandMarkets Analysis

The AT cut crystal oscillator market was valued at the largest market size of $XX million in 2013. This is expected to reach $XX million by 2020, growing at a CAGR of XX% from 2014 to 2020. The AT cut crystal oscillator has excellent temperature and frequency characteristics and is available at a low cost, which makes it the most preferred oscillator in many applications.

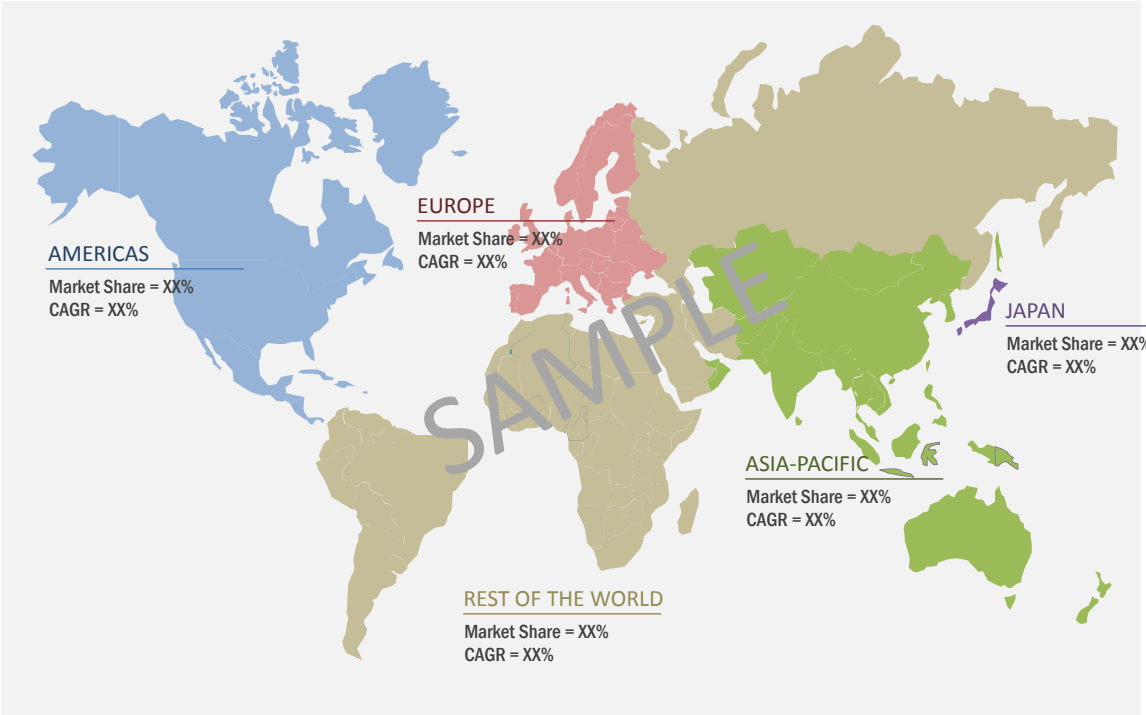
FIGURE 4 CRYSTAL OSCILLATOR MARKET SIZE, BY MOUNTING SCHEME, 2012 - 2020 ($MILLION)



Source: Annual Reports, SEC Filings, Press Releases, Magazines, Investor Presentations, Expert Interviews, and MarketsandMarkets Analysis

The surface mount crystal oscillator market was valued at $XX million in 2013, which is expected to reach $XX million by 2020, at a CAGR of XX% during the forecast period. The through-hole market was valued at $XX million in 2013, which is expected to reach $XX million by 2020, at a CAGR of XX% from 2014 to 2020. Surface mount has the highest market share as this method has several advantages such as low production cost, higher component density, and so on.

FIGURE 5 GLOBAL CRYSTAL OSCILLATOR MARKET SHARE, BY GEOGRAPHY, 2013



Source: Annual Reports, SEC Filings, Press Releases, Magazines, Investor Presentations, Expert Interviews, and MarketsandMarkets Analysis

Note: CAGR mentioned in the figure are for the period 2014-2020.

The North American market was valued at $XX million in 2013, which is expected to reach $XX million by 2020, at an estimated CAGR of XX% during the forecast period. The total market size for APAC region was valued at $XX million in 2013 and is expected to reach $XX million by 2020, at an estimated CAGR of XX% from 2014 to 2020. Due to the presence of the large semiconductor companies, consumer electronics manufacturers and crystal oscillator manufacturers, APAC is witnessing the highest growth rate for crystal oscillators.

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