CRYSTAL OSCILLATOR

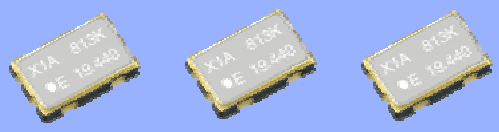
SPXO

TCO - 710x series

- Frequency range : 1.5 MHz to 75 MHz
- Supply voltage : 3.3 V
- Thickness : 1.0 mm Typ.
- Function : Standby ($\overline{ST}$)

Pb Free
RoHS Compliant

Product Number (please contact us)
X1G00xxx1xxxx00



Actual size



Specifications (characteristics)

Item	Symbol	TCO-710*X1A*	Remarks
Output frequency range	f_O	1.500 MHz to 75.000 MHz	Please contact us for inquiries regarding the available frequencies.
Supply voltage	V_{CC}	3.3 V ±0.33 V	
Storage temperature range	T_stg	-40 °C to +85 °C	Store as bare product after unpacking.
Operating temperature range	T_use	As per below description	
Frequency tolerance	f_tol	As per below description.	
Current consumption	I_{CC}	20 mA Max.	No load condition
Symmetry	SYM	40 % to 60 %	50 % V_{CC} level
High output voltage	V_{OH}	90 % V_{CC} Min.	I_{OH}=-5 mA
Low output voltage	V_{OL}	10 % V_{CC} Max.	I_{OL}=5 mA
Output load condition (CMOS)	L_CMOS	15 pF Max.	
Output enable / disable input voltage	V_{IH}	70 % V_{CC} Min.	V_{IH} or OPEN : Enable
	V_{IL}	30 % V_{CC} Max.	V_{IL} or GND : Disable
Rise time / Fall time	t_r/ t_f	6 ns Max.	10 % V_{CC} to 90 % V_{CC} level
Start-up time	t_str	10 ms Max.	Time at minimum supply voltage to be 0 s
Frequency aging	f_aging	±5 × 10^{-6} / year Max.	+25 °C, V_{CC}=3.3 V, First year

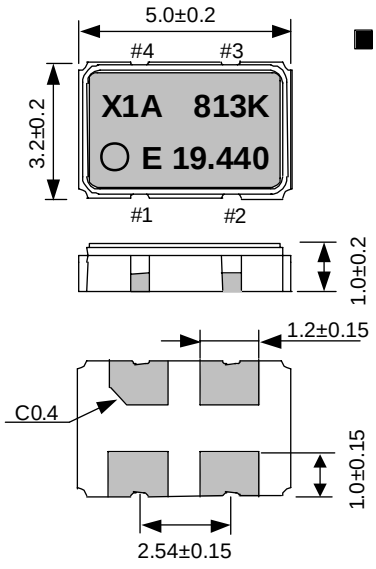
* Part Number

TCO - 7 1 0 _ X 1 A

<Frequency tolerance / V_{CC} tolerance>
±50 × 10^{-6} Max. / V_{CC} ±10 % : 6
±100 × 10^{-6} Max. / V_{CC} ±10 % : 7

<Operating temperature range>
BLANK: 0 °C to +70 °C
1: -10 °C to +70 °C
2: -20 °C to +70 °C
4: -40 °C to +85 °C

External dimensions (Unit:mm)

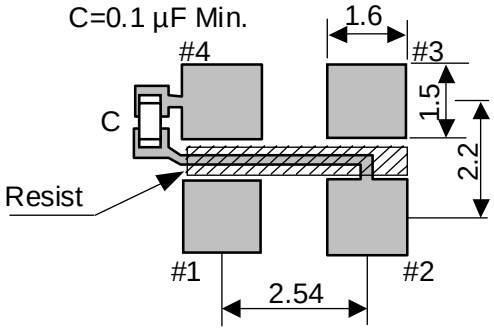


■ Pin map

Pin	Connection
1	$\overline{ST}$
2	GND
3	OUT
4	Vcc

Note.
$\overline{ST}$ pin = HIGH or "open" : Specified frequency output.
$\overline{ST}$ pin = LOW : Output is high impedance, oscillation stops.

Footprint (Recommended) (Unit:mm)



“QMEMS” EPSON TOYOCOM

In order to meet customer needs in a rapidly advancing digital, broadband and ubiquitous society, we are committed to offering products that are one step ahead of the market and a rank above the rest in quality. To achieve our goals, we follow a “3D (three device) strategy” designed to drive both horizontal and vertical growth. We will to grow our three device categories of “Timing Devices”, ”Sensing Devices” and “Optical Devices”, and expand vertical growth through a combination of products from these categories.
A Quartz MEMS is any high added value quartz device that exploits the characteristics of quartz crystal material but that is produced using MEMS (micro-electro-mechanical system) processing technology.
Market needs are advancing faster than previously imagined toward smaller, more stable crystal products, but we will stay ahead of the curve by rolling out products that exceed market speed and quality requirements. We want to further accelerate the 3D strategy by QMEMS.

Quartz devices have become crucial in the network environment where products are increasingly intended for broadband, ubiquitous applications and where various types of terminals can transfer information almost immediately via LAN and WAN on a global scale. Epson Toyocom Corporation addresses every single aspect within a network environment. The new corporation offers “Digital Convergence” solutions to problems arising with products for consumer use, such as, core network systems and automotive systems.

QMEMS

PROMOTION OF ENVIRONMENTAL MANAGEMENT SYSTEM CONFORMING TO INTERNATIONAL STANDARDS

At Epson Toyocom, all environmental initiatives operate under the Plan-Do-Check-Action(PDCA) cycle designed to achieve continuous improvements. The environmental management system (EMS) operates under the ISO 14001 environmental management standard.

ISO 14000 is an international standard for environmental management that was established by the International Standards Organization in 1996 against the background of growing concern regarding global warming, destruction of the ozone layer, and global deforestation.

All of our major manufacturing and non-manufacturing sites,in Japan and overseas, completed the acquisition of ISO 14001 certification.
In the future, new group companies will be expected to acquire the certification around the third year of operations.

WORKING FOR HIGH QUALITY

In order provide high quality and reliable products and services than meet customer needs,
Epson Toyocom made early efforts towards obtaining ISO9000 series certification and has acquired ISO9001 for all business establishments in Japan and abroad. We have also acquired ISO/TS 16949 certification that is requested strongly by major automotive manufacturers as standard.

QS-9000 is an enhanced standard for quality assurance systems formulated by leading U.S. automobile manufacturers based on the international ISO 9000 series.

ISO/TS 16949 is a global standard based on QS-9000, a severe standard corresponding to the requirements from the automobile industry.

►Explanation of the mark that are using it for the catalog

Pb Free	**►Pb free.** **►Complies with EU RoHS directive.**
RoHS Compliant	**►Pb free terminal designed. Contains Pb in products exempted by RoHS directive.** **(Contains Pb in sealing glass, high melting temperature type solder or other.)** **►Complies with EU RoHS directive.**
For Automotive	**►The products have been designed for high reliability applications such as Automotive.**

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- These products are intended for general use in electronic equipment. When using them in specific applications that require extremely high reliability, such as the applications stated below, you must obtain permission from Epson Toyocom in advance.
  / Space equipment (artificial satellites, rockets, etc.) / Transportation vehicles and related (automobiles, aircraft, trains, vessels, etc.)
  / Medical instruments to sustain life / Submarine transmitters / Power stations and related / Fire work equipment and security equipment
  / traffic control equipment / and others requiring equivalent reliability.
- In this new crystal master for Epson Toyocom, product codes and markings will remain as previously identified prior to the merger.
  Due to the on-going strategy of gradual unification of part numbers, please review product codes and markings, as they will change during the course of the coming months.

  We apologize for the inconvenience, but we will eventually have a unified part numbering system for Epson Toyocom that will be user friendly.