MHz RANGE CRYSTAL UNIT
MINIATURE SIZE LOW PROFILE SMD

TSX-3225

- Nominal frequency range : 12 MHz to 54 MHz
- Thickness : 0.6mm Max.
- Overtone order : Fundamental
- Applications : Mobile phone, Bluetooth, W-LAN ISM band radio, Clock for MPU
- Lead(Pb)-free : Lead free completely

Actual size

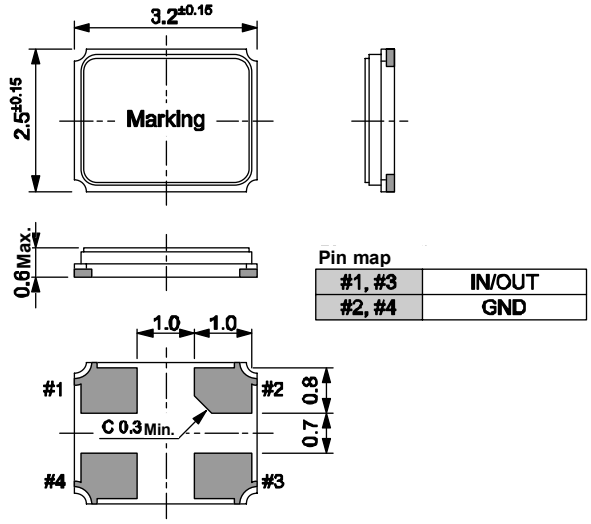
Specifications (characteristics)

Item	Symbol	Specifications	Remarks
Nominal frequency range	f	12.000 MHz to 54.000 MHz	Fundamental
Storage temperature range	T_stg	-40 °C to +85 °C	
Operating temperature range	T_use	-20 °C to +75 °C	
Level of drive	DL	100 µW Max.	
Frequency tolerance (standard)	f_tol	$\pm 10 \times 10^{-6}$	+25 °C
Frequency versus temperature characteristics (standard)	f_tem	$\pm 10 \times 10^{-6}$	-20 °C to +75 °C
Load capacitance	CL	9 pF to ∞ (standard: 9 pF, 12 pF, 16 pF, ∞)	Please specify.
Motional resistance (ESR)	R_1	As per below table	-20 °C to +75 °C
Frequency aging	f_age	$\pm 1 \times 10^{-6}$ / year Max.	+25 °C, First year

Motional resistance (ESR)

Frequency	Motional resistance
12.0 MHz ≤ f < 16.0 MHz	100 Ω Max.
16.0 MHz ≤ f < 21.0 MHz	60 Ω Max.
21.0 MHz ≤ f ≤ 54.0 MHz	40 Ω Max.

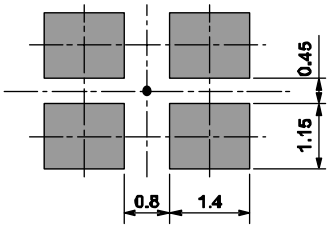
External dimensions (Unit:mm)



Pin map

#1, #3	IN/OUT
#2, #4	GND

Footprint (Recommended) (Unit:mm)



End to End EPSON TOYOCOM

The development of our ubiquitous network society has caused a diversification of applications and has increased the demand for high-level quartz devices in terms of quality, quantity, and function.
The Quartz Device Operations Division of SEIKO EPSON CORPORATION (EPSON)and TOYO COMMUNICATION EQUIPMENT CO.,LTD.(TOYOCOM) were integrated on October 1,2005 to establish a new company, EPSON TOYOCOM CORPORATION, to meet these market and customer demands.

Each company contributes its own strength; EPSON holds a strong presence in consumer products and TOYOCOM is strong in industrial products. The consolidation of these two companies in a new company that provides advanced expertise with a wide range of products for terminals and infrastructure to our customers.
Quartz device 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 “end-to-end” solutions to problems arising with products for consumer use, such as core network systems and automotive systems.

PROMOTION OF ENVIRONMENTAL MANAGEMENT SYSTEM CONFORMING INTERNATIONAL STANDARD

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.
In May 2001, 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.

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.

WORKING FOR HIGH QUALITY

EPSON TOYOCOM quickly began working to aquire company-wide ISO 9000 series certification, and has acquired ISO 9001 or ISO 9002 certification with all targeted products manufactured in Japanese and overseas plants.

The Quartz Device Operations Division (Ina Japan,EPM and SZE) have acquired QS-9000 certification, which are of higher Level.
Also QS-9000 and TS 16949 certification, which is of higher level, has been acquired.

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 automobile industry.

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  / 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 code and marking will still remain as previously identified prior to the merger.
  Due to the on going strategy of gradual unification of part numbers, please review product code and marking 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 which will be user friendly.