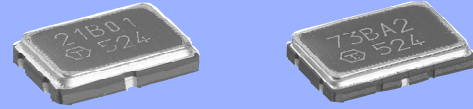


CRYSTAL FILTER FOR RADIO EQUIPMENT / IF

TS2-21B01/-21B02/-45A01
TS3-45A01
TF3-73BA1
TF4-73BA2

- Superb attenuation with 4 pole filters.
- Applications : Various kinds of radio equipment
- Lead(Pb)-free : Lead free completely



Actual size

TS-75A



TS-75B

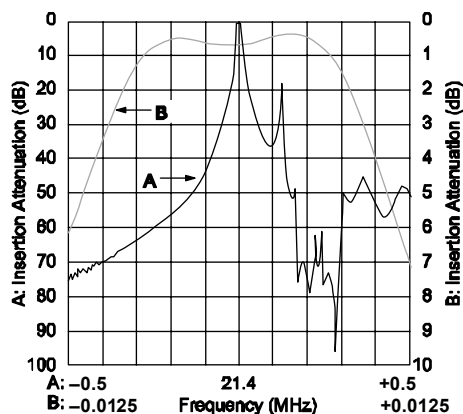


Specifications (characteristics)

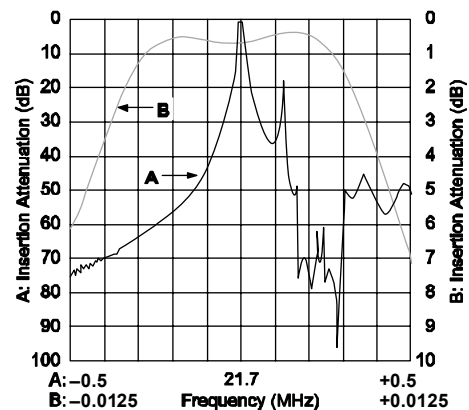
Item	Symbol	TS2-21B01	TS2-21B02	TS2-45A01	TS3-45A01	TF3-73BA1	TF4-73BA2
Nominal frequency	f_0	21.4 MHz	21.7 MHz	45 MHz	45 MHz	73.35 MHz	73.35 MHz
Storage temperature range	T_{stg}	-40 °C to +85 °C	-40 °C to +85 °C	-40 °C to +85 °C	-40 °C to +85 °C	-40 °C to +85 °C	-40 °C to +85 °C
Operating temperature range	T_{use}	-30 °C to +85 °C	-30 °C to +85 °C	-30 °C to +85 °C	-30 °C to +85 °C	-30 °C to +85 °C	-30 °C to +85 °C
Number of poles	—	2	2	2	3	3	4
Passband	BW	$f_0 \pm 7.5$ kHz Min. (3 dB down)	$f_0 \pm 7.5$ kHz Min. (3 dB down)	$f_0 \pm 15$ kHz Min. (3 dB down)	$f_0 \pm 15$ kHz Min. (3 dB down)	$f_0 \pm 6.5$ kHz Min. (3 dB down)	$f_0 \pm 7.5$ kHz Min. (3 dB down)
Insertion loss	IL	2 dB Max.	2 dB Max.	3 dB Max.	3 dB Max.	4 dB Max.	5 dB Max.
Ripple	Ri	1 dB Max.	1 dB Max.	1 dB Max.	1 dB Max.	1 dB Max.	1 dB Max.
Stop band attenuation	—	$f_0 \pm 25$ kHz Max. (15 dB down)	$f_0 \pm 25$ kHz Max. (15 dB down)	$f_0 \pm 50$ kHz Max. (15 dB down)	$f_0 \pm 50$ kHz Max. (20 dB down)	$f_0 \pm 25$ kHz Max. (18 dB down)	$f_0 \pm 25$ kHz Max. (30 dB down)
Attenuation	ATT	70 dB Min. ($f_0 - 910$ kHz)	70 dB Min. ($f_0 - 910$ kHz)	70 dB Min. ($f_0 - 800$ kHz to $f_0 - 1000$ kHz)	70 dB Min. ($f_0 - 800$ kHz to $f_0 - 1000$ kHz)	70 dB Min. ($f_0 - 800$ kHz to $f_0 - 1000$ kHz)	80 dB Min. ($f_0 - 800$ kHz to $f_0 - 1000$ kHz)
Terminating impedance	Z	1500 Ω // 2.5 pF	1500 Ω // 2.5 pF	1100 Ω // 0 pF	1200 Ω // -1.0 pF	400 Ω // -1.2 pF	500 Ω // +3.5 pF
Package	—	TS-75A	TS-75A	TS-75A	TS-75A	TS-75A	TS-75B

Electrical DATA

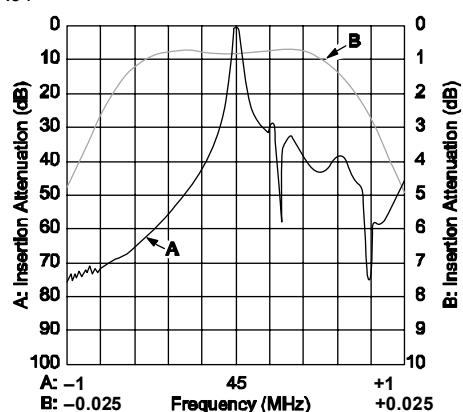
TS2-21B01



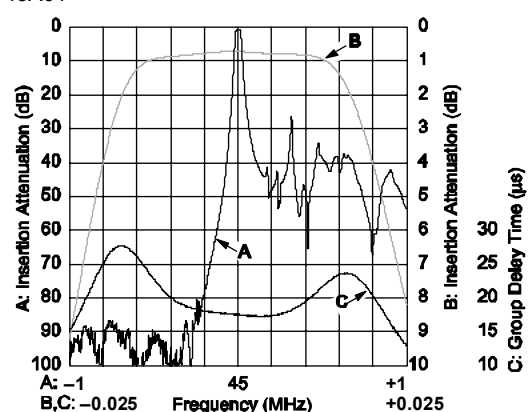
TS2-21B02



TS2-45A01

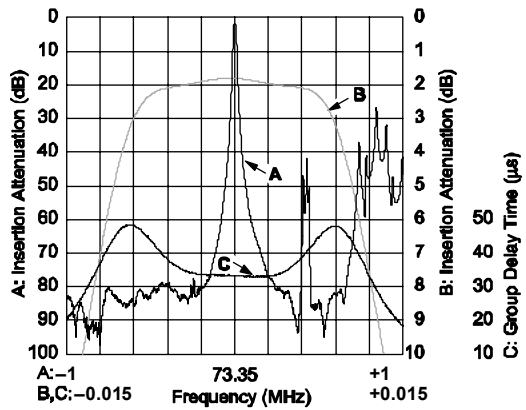


TS3-45A01

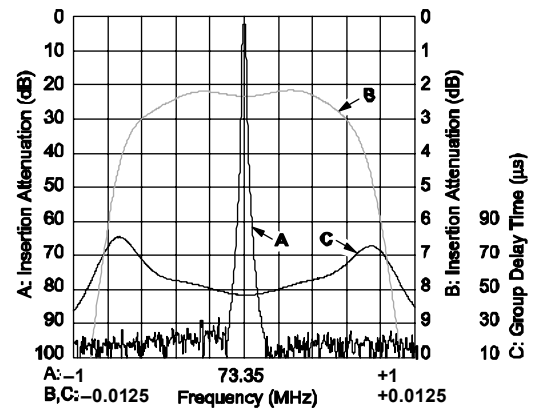


Electrical DATA

TF3-73BA1



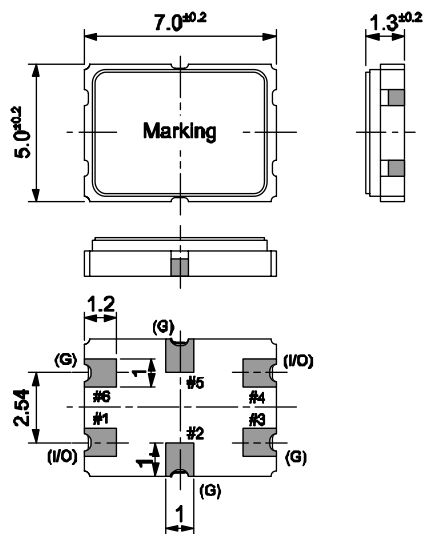
TF4-73BA2



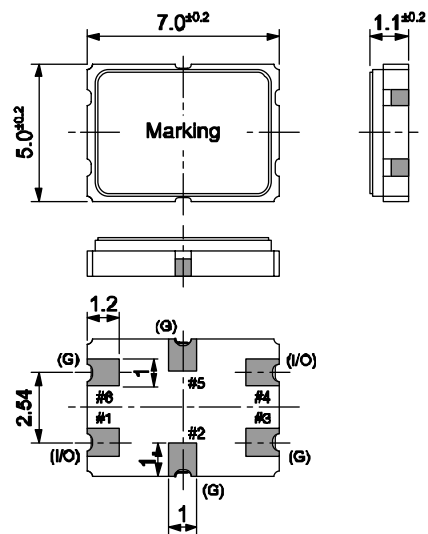
External dimensions

(Unit : mm)

TS-75A



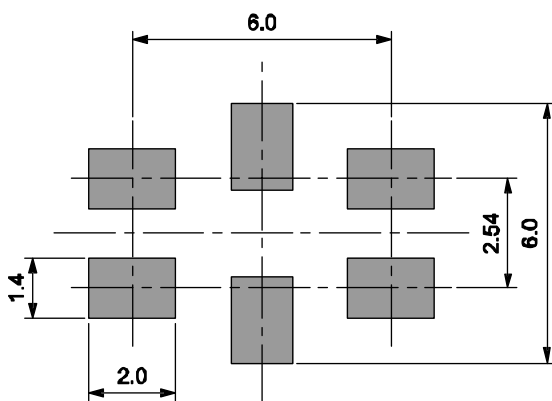
TS-75B



Footprint (Recommended)

(Unit : mm)

TS-75A / TS-75B



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 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 "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 acquire 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 (In 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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 - / 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.