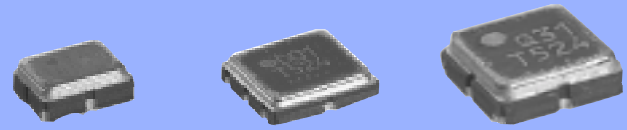




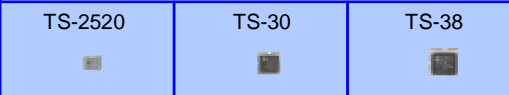
CRYSTAL FILTER FOR MINIATURE SIZE RADIO EQUIPMENT/ IF

TF2-D0AD6 / TF2-45BB1 TF3-J3DC5 / TF3-Q3GC1 TS3-D0A31

- High frequency and outstanding mechanical strength with original inverted-mesa structure.
- High frequency 3 pole filters with original process technology.
- Applications : Various kinds of miniature size radio equipment



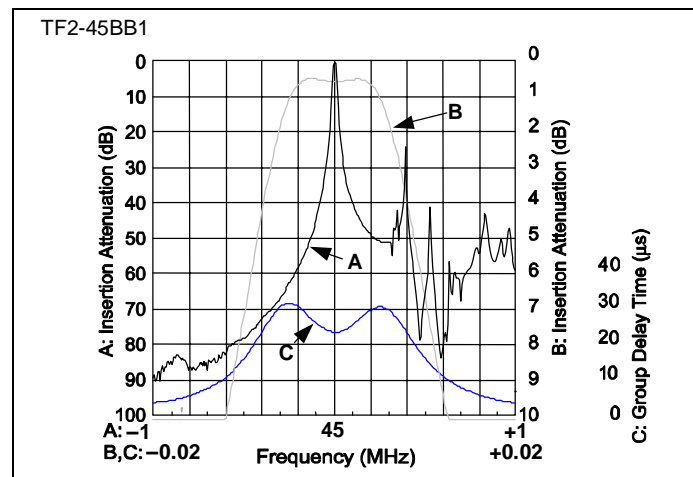
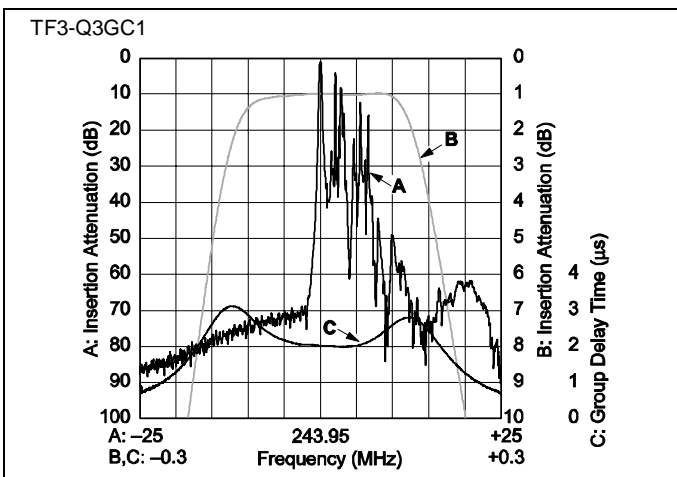
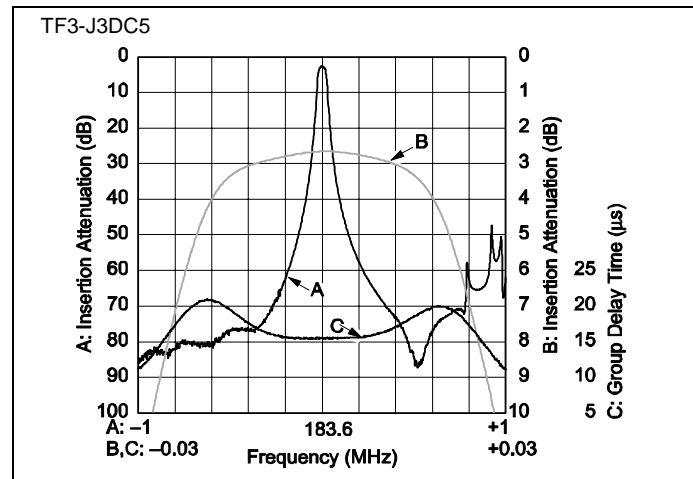
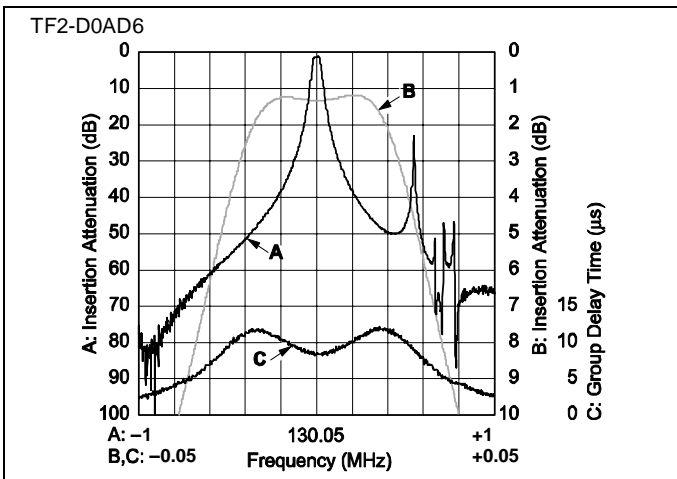
Actual size (Package size)



Specifications (characteristics)

Item	Symbol	TF2-D0AD6	TF3-J3DC5	TF3-Q3GC1	TF2-45BB1	TS3-D0A31
Nominal frequency	f_0	130.05 MHz	183.6 MHz	243.95 MHz	45 MHz	130.05 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
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
Number of poles	—	2	3	3	2	3
Passband	BW	$f_0 \pm 10.5$ kHz Min. (1 dB down)	$f_0 \pm 13$ kHz Min. (3 dB down)	$f_0 \pm 130$ kHz Min. (3 dB down)	$f_0 \pm 7.5$ kHz Min. (3 dB down)	$f_0 \pm 14$ kHz Min. (3 dB down)
Insertion loss	IL	3 dB Max.	4.5 dB Max.	3 dB Max.	3.5 dB Max.	3 dB Max.
Ripple	Ri	1 dB Max.	1 dB Max.	1 dB Max.	1 dB Max.	1 dB Max.
Stop band attenuation	—	$f_0 \pm 50$ kHz Max. (10 dB down)	$f_0 \pm 60$ kHz Max. (20 dB down)	$f_0 \pm 600$ kHz Max. (20 dB down)	$f_0 \pm 25$ kHz Max. (15 dB down)	$f_0 \pm 50$ kHz Max. (20 dB down)
Attenuation	ATT	70 dB Min. (f_0 -900 kHz)	60 dB Min. (f_0 -330 kHz to f_0 -660 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)
Terminating impedance	Z	200 Ω //1.7 pF	150 Ω //0.8 pF	800 Ω //0.8 pF	650 Ω //1.5 pF	950 Ω //1.2 pF
Package	—	TS-2520	TS-30	TS-30	TS-38	TS-38

Electrical DATA



“3D STRATEGY” 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.

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.

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. 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 for all targeted products manufactured in Japanese and overseas plants.

Epson Toyocom has acquired QS-9000 certification, which is of a higher level. Also, TS 16949 certification, which is also of a 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 the 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 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.