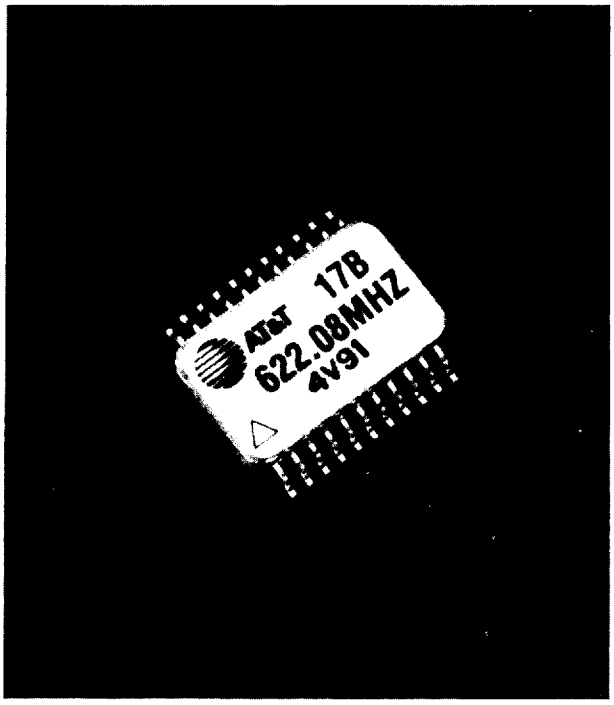
Data Sheet

17-Type SAW Filters (500 MHz to 800 MHz)



The 17-Type SAW Filters.

Features

- Compatible with SONET standards at OC-12
- Small, 22-pin surface-mount package
- Single-ended or balanced input and output
- Choice of center frequency
- Consistent performance
- Spurious-free response
- No tuning needed
- Low temperature drift
- High reliability
- Low aging
- Low cost

Description

The 17-Type devices are high-Q, precision surface-acoustic wave filters fabricated on a high-stability quartz substrate material. They are designed to perform a clock extraction function used in data retiming or clock recovery applications (in the frequency range of 500 MHz to 800 MHz). These devices are hermetically packaged in a low-profile, 22-pin, metal surface-mount package. Their reliability is excellent with a FIT rate usually less than 50.

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Pin Information

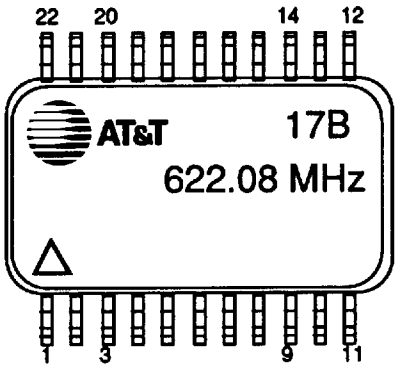

Figure 1. Pin Diagram

Table 1. 17-Type Pin Descriptions

Note: I/O grounds are isolated from the case.

Pin #	Description
3	Input
9	Output
14	Output Ground
20	Input Ground
All others	Case Ground

Absolute Maximum Ratings

Stresses in excess of the Absolute Maximum Ratings can cause permanent damage to the device. These are absolute stress ratings only. Functional operation of the device is not implied at these or any other conditions in excess of those given in the operational sections of the data sheet. Exposure to Absolute Maximum Ratings for extended periods can adversely affect device reliability.

Parameter	Value
Storage Temperature	–55 °C to +85 °C
Lead Soldering Temperature/Time*	230 °C/30 s
Case Soldering Temperature/Time*	230 °C/30 s
Case Epoxy Attach Cure Temperature/Time	150 °C/2 hrs
Maximum Continuous Input Signal	0 dBm
dc Bias (continuous)	0 V
dc Surge	10 V/3 s

* The temperature refers to the PC board temperature.

Handling Precautions

Although protection circuitry has been designed into this device, proper precautions should be taken to avoid exposure to electrostatic discharge (ESD) during handling and mounting. The ESD threshold is 1500 V.

Electrical Specifications

Table 2. 17A and 17B (622.08 MHz) Filter Characteristics (measured at 25 °C in a 50 Ω system)

Note: These specifications are subject to change without notice.

Parameter	Min	Nom	Max	Unit
Center Frequency	622.018	622.080	622.142	MHz
Insertion Loss at 622.08 MHz	13	15.5	17.5	dB
Loaded 3 dB Q	700	800	900	—
Transmission Phase Slope	—	–0.33	—	°
Phase Deviation from Linear	—	—	10	°
Jitter Transfer Function Peak	—	0	0.2	dB
Amplitude Variation	—	—	1	dB
Input Return Loss	3.0	—	—	dB
Output Return Loss	2.7	—	—	dB
First Sideband Rejection	25	30	—	dB
Ultimate Rejection (0 MHz to 800 MHz)	28	40	—	dB
Operating Temperature	–40	—	85	°C
Total Phase Drift Over Temperature				
17A	—	—	130	°
17B	—	—	70	°

Parameter Definitions

Center Frequency: The average of the upper and lower frequencies where the insertion loss is 3 dB greater than the loss at the baud frequency. These measurements are made at room temperature (25 °C).

Insertion Loss: The attenuation level at the baud frequency.

Loaded 3 dB Q: The ratio of the baud frequency to the 3 dB passband. The passband is calculated as the difference between the upper and lower frequencies where the insertion loss is 3 dB greater than the loss at the baud frequency. The measurements are made with the filter loaded with 50 Ω at its input and output.

Transmission Phase Slope (the slope of the phase of a filter's transmission response)**:** The slope is measured in the frequency domain calculated from a linear least-squares (straight line) fit over a 3 dB bandwidth.

Phase Deviation from Linear: The maximum deviation (residual value) of the transmission phase from a linear least-squares (straight line) fit over the passband.

Jitter Transfer Function Peak: The maximum value of the jitter transfer function. The jitter transfer function is calculated from the transmission response of the filter. Refer to the related application note for further information on this parameter.

Amplitude Variation: The difference between the insertion loss at the baud frequency and the minimum insertion loss.

First Sideband Rejection: The attenuation level at the first filter sidelobe relative to the insertion loss.

0 MHz to 800 MHz Band Rejection: The attenuation level relative to the insertion loss in the frequency range of 0 MHz to 800 MHz. This does not include the passband and the first sideband.

Total Phase Drift over Temperature: The total change in the transmission phase of the filter over the filter's operating temperature range. This change is measured at the baud frequency.

Characteristic Curves

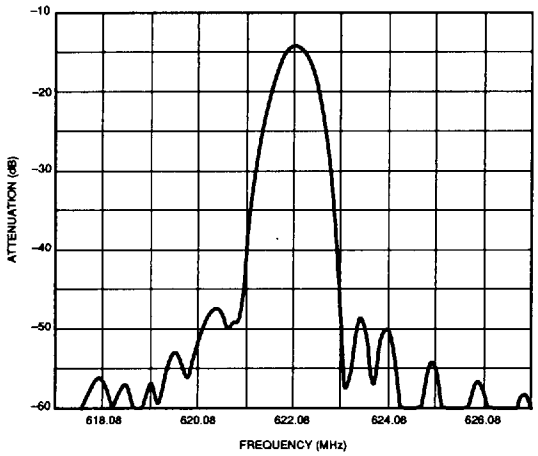

Figure 2. 17A/B Transmission Response

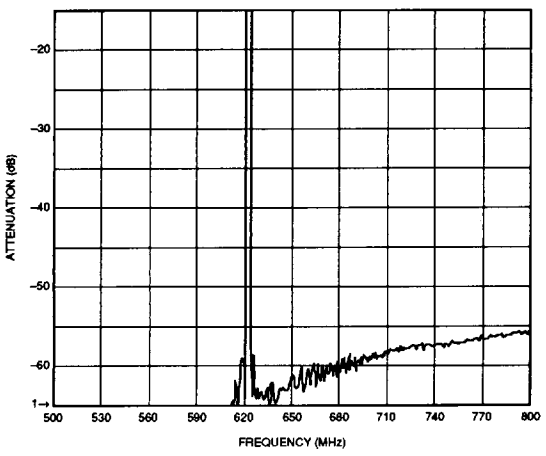

Figure 3. 17B Wideband Transmission Response

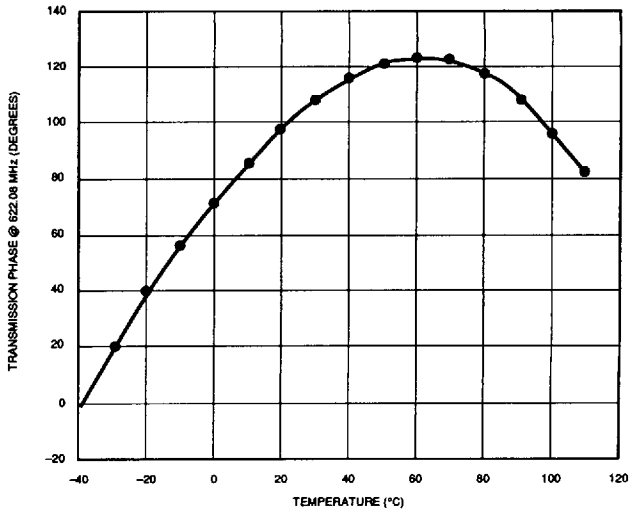

Figure 4. 17A Temperature Characteristics (622.08 MHz)

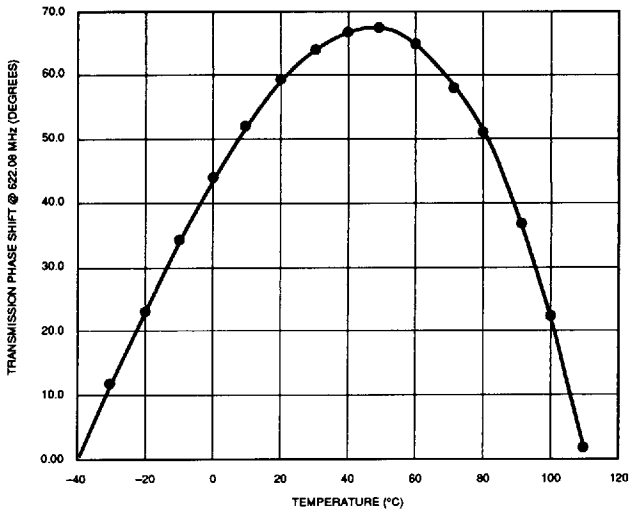

Figure 5. 17B Temperature Characteristics

Mechanical and Environmental Characteristics

Parameter	Description
Physical Dimensions	Package exterior dimensions comply with MIL.STD.883C, Method 2016.
Solderability	Tested using MIL.STD.883C, Method 2003.4.
Resistance to Solvents	Compliant with MIL.STD.883C, Method 2015.6.
Interior Water Vapor	Residual gas analysis complies with MIL.STD.883C, Method 1018.2.
Leak Test	Gross and fine leak tests are performed to MIL.STD.883C, Method 1014.7 (Tests A, C) to 5×10^{-8} atm-cc/s.
Mechanical Shock Test	Uses a 100 g, half-sine pulse of 0.5 µs duration, 5 pulses per axis, along x, y, and z axes, per MIL.STD.883C, Method 2002.3.
Mechanical Vibration Test	Uses a 20 g peak acceleration, 20 Hz to 2000 Hz, 4 min. up and down in frequency, 4 times per axis, along x, y, and z axes, per MIL.STD.883C, Method 2007.1, Test A.
Temperature Cycle and Thermal Shock Test	Air-to-air thermal shock over a temperature range of –40 °C to +130 °C, dwelling 5 min. at each temperature extreme, and repeating for 300 cycles.
Wirebond Strength	Destructive wirebond pull test per MIL.STD.883C, Method 2011.5.
ESD Sensitivity	ESD threshold level is measured using a charged-device model and a human-body model.

Ordering Information

Device	Comcode
17A	106 211 139
17B	106 414 899