

## DATA SHEET

## 3500 Series: Temperature-Stable Resonators

### Applications

- Multi-pole filters
- DROs
- Fixed and auto-tuned combiners

### Features

- High Q ( $Q_f \geq 70,000$ ) at 1 GHz
- Linear  $\tau_f$
- Low cost
- Potential size reduction
- Temperature stability
- Low loss
- Wide  $\tau_f$  range
- Mid-range  $\epsilon'$

### Description

Trans-Tech, offers the 3500 series of temperature-stable resonators.

The 3500 series ceramic material is intended primarily for oscillators and multi-pole filters within the 1,500 to 13,800 MHz frequency range. This material typically yields an unloaded Q of 38,000 at 2 GHz.



**Table 1. Temperature Characteristics**

Series	Type	Dielectric Constant	Temperature Coefficient of $f_0$ ( $\tau_f$ )	Q at 2 GHz
D/C35	16	35.5	+6	>38000
D/C35	13	34.75	+3	
D/C35	00	34.50	0	
D/C35	03	33.50	-3	
D/C35	16	35.5	+6	

**Note:** Contact us for custom  $\tau_f$  and other tolerances ( $\pm 1$  or  $\pm 2$  standard available). Other  $\tau_f$  available on request.

**Table 2. Material Characteristics**

Item	Value
Dielectric constant	33.5 to 35.5
Temperature coefficient of resonant frequency ( $\tau_f$ ) (ppm/ $^{\circ}$ C) (25 to 60 $^{\circ}$ C)	-3 to +6
Q (1/tan $\delta$ ) minimum	>38,000 at 2 GHz
Thermal expansion (ppm/ $^{\circ}$ C) (20 $^{\circ}$ C to 200 $^{\circ}$ C)	10
Thermal conductivity (cal/cm-sec $^{\circ}$ C) at 25 $^{\circ}$ C	-0.006
Non-linearity coefficient ( $\tau_f$ ) (ppm/ $^{\circ}$ C <sup>2</sup> )	<0.01
Specific heat (cal/g $^{\circ}$ C)	-0.07
Density (g/cc)	>6.4
Water absorption (%)	<0.01



Trans-Tech products are compliant with all applicable legislation and are halogen-free.



For additional information, refer to *Trans-Tech's* document RFC-F0028, RFC-F0029, and RFC-F0022

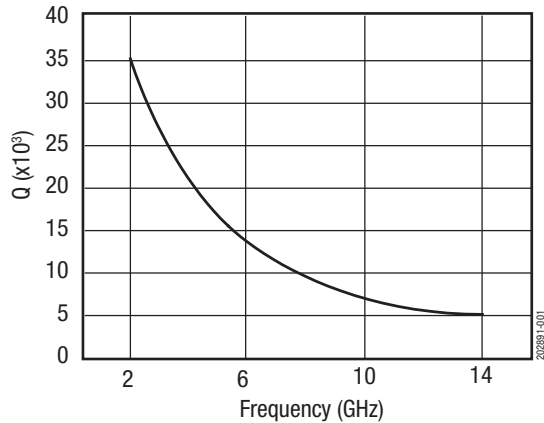


Figure 1. Typical Q vs Frequency

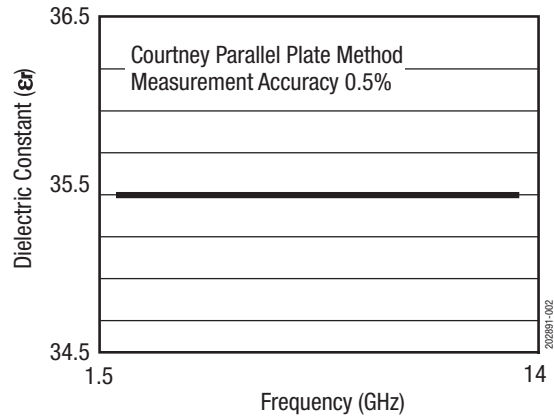


Figure 2. Typical εr vs Frequency

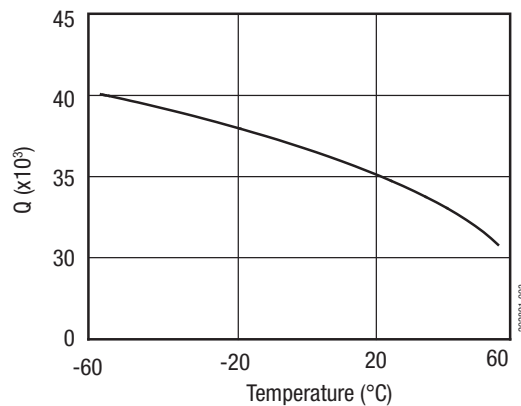


Figure 3. Typical Q vs Temperature

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