

## DATA SHEET

## 4300 Series: Temperature-Stable Dielectric Resonators

### Applications

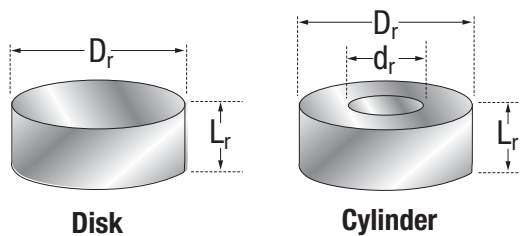
- Base station filters and combiners
- Microwave filters and oscillators
- All cellular and PCN platforms
- DROs for LNBS

### Features

- High  $\epsilon'$
- High Q (assemblies are available)
- Wide  $\tau f$  range
- Small size
- Repeatability of design
- Low insertion loss
- High stability DRO design
- Ease of compensation for temperature drift
- Linear temperature coefficient

### Description

Trans-Tech offers the 4300 series of temperature-stable dielectric resonators, designed for frequency operation from 1500 MHz to 13.8 GHz. The 4300 series offers reduced size while maintaining high Q Factor (Q). Custom temperature coefficients are available.



**Figure 1. 4300 Disk and Cylinder**



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



**Table 1. Temperature Characteristics for Series D/C43**

Type	Dielectric Constant	Temperature Coefficient of $f_0$ ( $\tau f$ ) $\pm 2$	Q at 4.3 GHz
16	43.0 $\pm$ 0.75	+6	>9500
13		+3	
00		0	
03		-3	
06		-6	

**Note:** Contact us for custom  $\tau f$  and other tolerances.

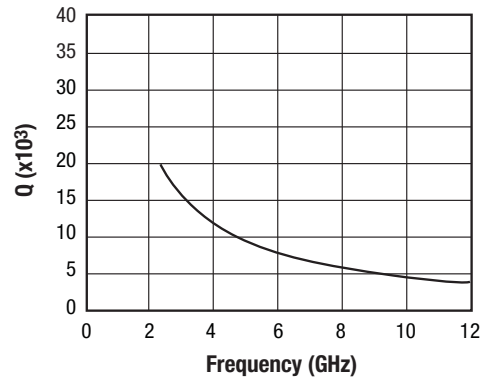
**Table 2. Material Characteristics**

Item	Value
Dielectric constant	43.0 $\pm$ 0.75
Temperature coefficient of resonant frequency ( $\tau f$ ) (ppm/ $^{\circ}$ C)	-6 to +6
Q (1/tan $\delta$ ) minimum	35,000 at 850 MHz 9500.0 at 4.3 GHz
Thermal expansion (ppm/ $^{\circ}$ C) (20 $^{\circ}$ C – 200 $^{\circ}$ C)	6.5
Thermal conductivity (cal/cm-sec $^{\circ}$ C) at 25 $^{\circ}$ C	$\sim$ 0.005
Non-linearity coefficient ( $\tau f'$ ) (ppm/ $^{\circ}$ C $^2$ )	-0.01
Specific heat (cal/g $^{\circ}$ C)	$\sim$ 0.15
Density (g/cc)	5
Water absorption	<0.01
Composition	Zirconium Titanate based

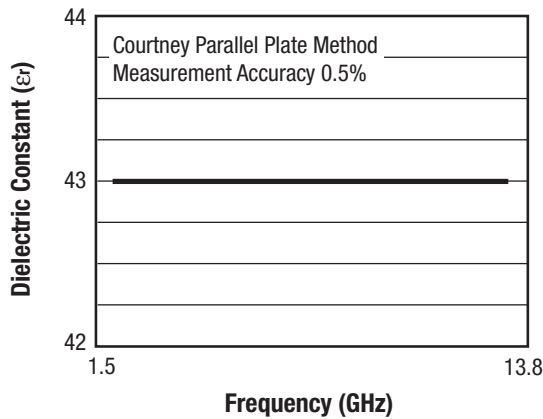
**Table 3. Disk and Cylinder Ranges**

Disk	Cylinder
<i>Diameter Range</i>	
Dr: 0.975 to 0.160 Lr: 35% to 45% of Dr dr: N/A	Dr: 0.975 to 0.245 Lr: 35% to 45% of Dr dr: 0.162 to 0.083
<i>Frequency Range</i>	
1.85 to 13.5	1.85 to 8.01

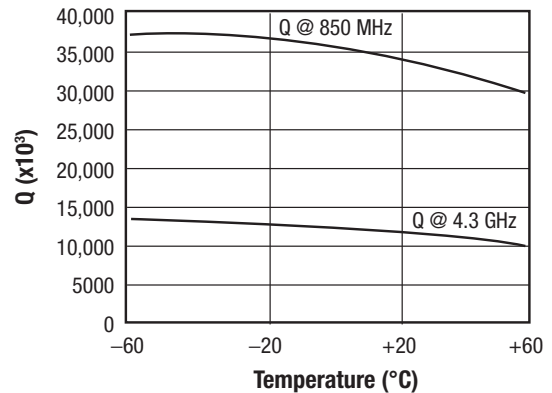
**Note:** Contact the factory for custom sizes.



**Figure 2. Typical Q vs Frequency**



**Figure 3. Typical (εr) vs Frequency**



**Figure 4. Typical Q vs Temperature**

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