

DATA SHEET

8300 Series: Temperature-Stable Resonators

Applications

- AMPS/GSM/PCS/DBS/TVRO
- Dielectric resonator oscillators
- Microwave filters and combiners

Features

- High ϵ'
- High Q
- Linear τf
- Frequency stability versus temperature
- Reduced size and weight
- Low loss
- Close channel spacing
- Ease of temperature compensation

Description

Trans-Tech offers the 8300 series of temperature-stable resonators for a Personal Communications System (PCS)/ Personal Communications Network (PCN)/ Digital Communications System (DCS)/ Global System for Mobile (GSM) communication application. The 8300 series combines a good Quality Factor (Q) with a reasonable cost. A wide range of temperature coefficients is available.

Size Recommendations

Common sizes accommodate frequencies from 0.8 GHz to 13.5 GHz. Our staff provides the experience to guide designers toward the best mechanical configuration for optimal performance in customer cavities.

Note: Components are custom manufactured. Contact us for advice on support, tuning, and resonator configurations. A frequency accuracy to 0.5% of a customer-provided correlation sample is standard.



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



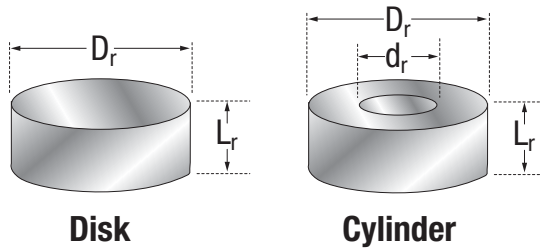
Table 1. Temperature Characteristics for Series D/C83

Type	Dielectric Constant	Temperature Coefficient of f_0 (τf) ± 2 (ppm/ $^{\circ}$ C)	Q at 4.3 GHz
74	36.5 ± 1.0	+9	>9500
73	36 ± 1	+6	
72	35.7 ± 1.0	+3	
71	35.5 ± 1.0	0	
70	35 ± 1	-3	

Note: Contact us for custom τf and other tolerances.

Table 2. Material Characteristics

Item	Value
Dielectric constant	35.0 to 36.5
Temperature coefficient of resonant frequency (τf) (ppm/ $^{\circ}$ C)	-3 to +9
Q (1/tan δ) minimum	9500 at 4.3 GHz 28,000 at 850 MHz
Insulation resistance (Ω cm) (volume resistivity) @ 25 $^{\circ}$ C	$\sim 10^{13}$
Thermal expansion (ppm/ $^{\circ}$ C) (20 $^{\circ}$ C – 200 $^{\circ}$ C)	10
Thermal conductivity (cal/cm-sec $^{\circ}$ C) at 25 $^{\circ}$ C	0.0045
Specific heat (cal/g $^{\circ}$ C)	0.15
Density (g/cc)	>4.65
Water absorption	<0.01
Composition	Titanate based
Color	Rust



K134

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: 1.4 to 0.245 Lr: 35% to 45% of Dr dr: 0.162 to 0.083
<i>Frequency Range</i>	
2080 MHz to 13,800 MHz	1450 MHz to 9010 MHz

Note: Contact us for custom sizes.

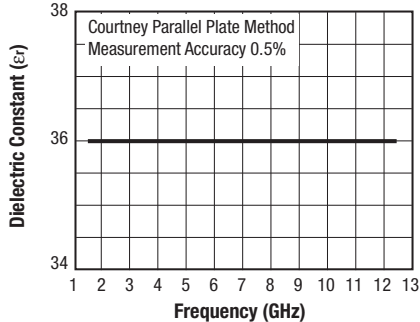


Figure 3. Typical (εr) vs Frequency

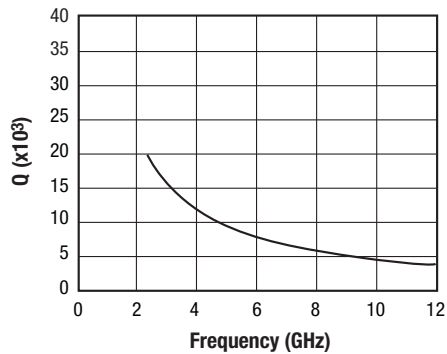


Figure 2. Typical Q vs Frequency

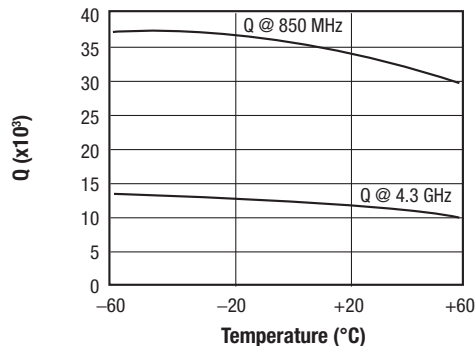


Figure 4. Typical Q vs Temperature

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