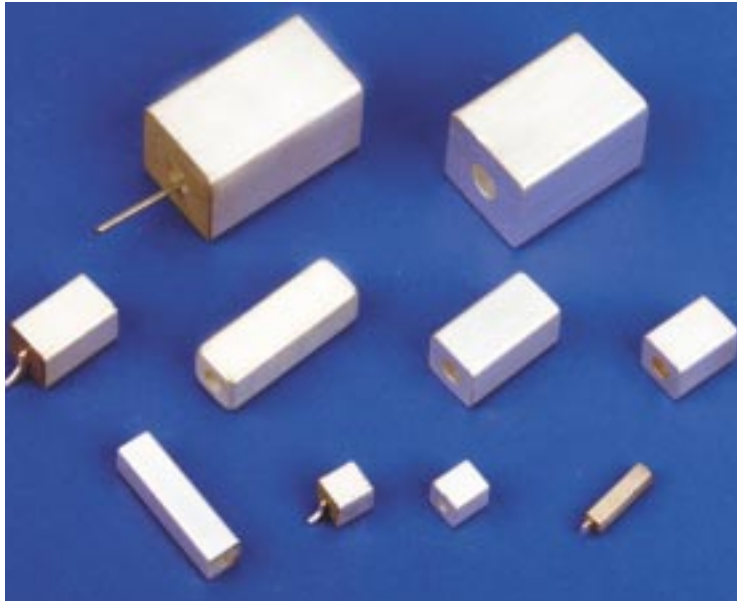




CERAMIC COAXIAL RESONATORS

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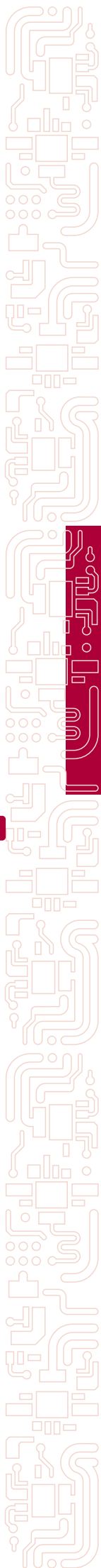


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MAIN FEATURES

Frequency:	300 MHz to 6 GHz
Size:	2 to 12mm
Dielectric constant:	ε21, ε37, ε90

**QUARTER WAVELENGTH
OR HALF WAVELENGTH
WITH OR WITHOUT CONNECTION**



CERAMIC COAXIAL RESONATORS

General characteristics

▶ GENERAL CHARACTERISTICS

DIMENSIONS AND CONFIGURATIONS

The TEMEX coaxial resonators are available over a frequency range of 300 MHz to 6 GHz with four preferred square cross section sizes, having side length of 2, 4, 6 and 12 mm.

Other square section dimensions 3, 8 and 10 mm (S) information can be obtained upon request.

Table 1 summarizes the choice of sizes and dielectric materials available.

The length of the component (L) can be determined from the chosen frequency (F) and dielectric constant (ϵ_r) as follows:

($\lambda/4$ application)

$$L = \frac{\lambda_0}{4 \sqrt{\epsilon_r}}$$

($\lambda/2$ application)

$$L = \frac{\lambda_0}{2 \sqrt{\epsilon_r}}$$

λ_0 in mm
L in mm
F in GHz

with $\lambda_0 = \frac{300}{F}$

A simplified formula for $\lambda/4$ applications:

$\epsilon_r = 21$	$L = \frac{16.37}{F}$
$\epsilon_r = 37$	$L = \frac{12.3}{F}$
$\epsilon_r = 90$	$L = \frac{7.9}{F}$

IMPEDANCE Z

The coaxial resonator impedance used in TEM mode is a direct function of its dimensions and of the dielectric material permittivity.

Table 2 indicates for each standard side length, and for each dielectric constant, the impedance value, independent of the resonator length

CERAMIC COAXIAL RESONATORS

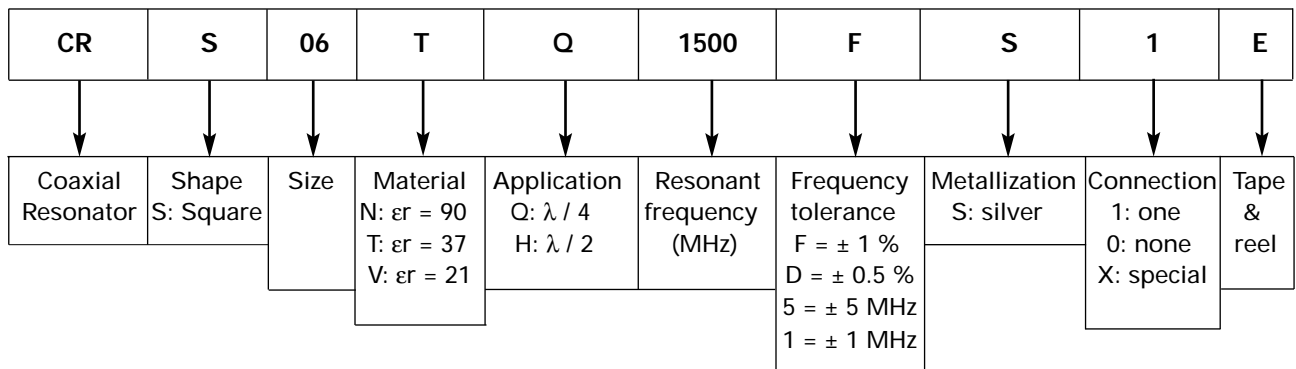
How to order?

Table 4: Standard frequency range $\lambda/4$ in MHz

	2 mm	3 mm	4 mm	6 mm	12 mm
$\epsilon 21$	2000 - 4000	1500 - 4000	1000 - 4000	600 - 2500	600 - 1250
$\epsilon 37$	1500 - 3000	1500 - 3000	800 - 3000	500 - 2000	450 - 1000
$\epsilon 90$	900 - 2000	650 - 2000	450 - 2000	450 - 1000	300 - 650

For special request, please consult your local Sales Office.

▶ HOW TO ORDER?





▶ APPLICATION NOTES

SOLDERING RECOMMENDATIONS

Before any soldering operation is implemented, the coaxial resonator must be preheated in order to avoid a thermal shock and a subsequent mechanical stress liable to initiate failure mechanism. TEMEX recommends a minimum preheating time of 2 minutes at 120° C with a maximum heating rate of 2° C / sec.

FREQUENCY ADJUSTMENT

When the frequency tuning adjustment is needed, two solutions can be adopted:

- a) Mechanical lapping of the ceramic, or mechanical grinding of metallization, depending where metallization will be grinded off.
- b) Using a TEMEX air or sapphire dielectric tuning capacitor ("[Air trimmer](#)" or "[Gigatrim](#)"): in this case, the frequency will decrease when capacitance will increase.

This provides an additional advantage of mounting / terminating resonator to the assembly by utilizing the leg configuration of the tuning capacitor.

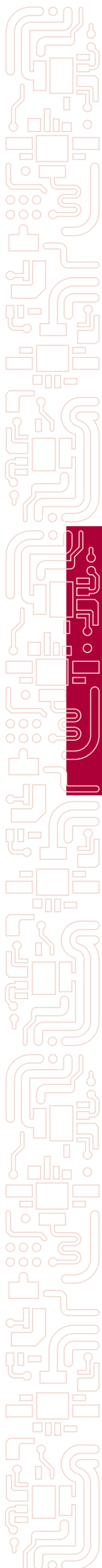
QUALITY FACTOR Q

The Q factor of a coaxial resonator is essentially determined by the metallization.

The dielectric material, having low losses, does not have a direct effect on the "Q" (secondary influence).

The curves show the range of "Q" factor versus resonator size and frequency range.

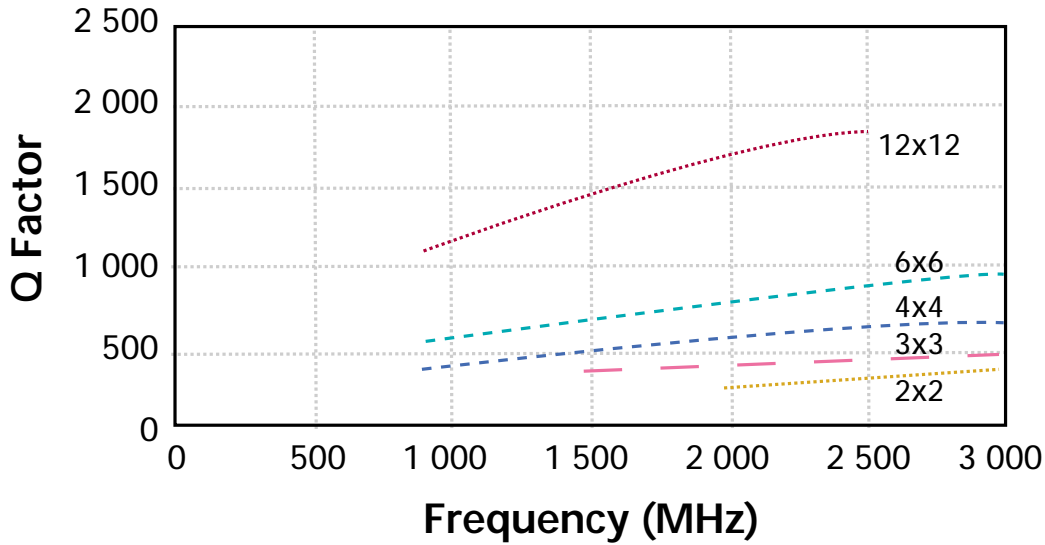
Curves show that Q min. increases as frequency increases (proportionally to $\sqrt{f_0}$).



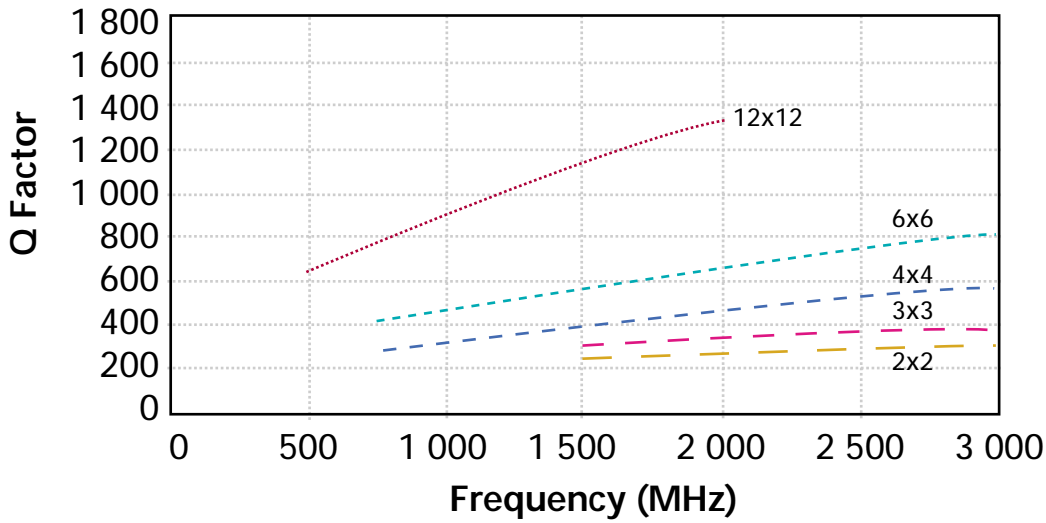
CERAMIC COAXIAL RESONATORS

Application notes

Dielectric Constant = 21



Dielectric Constant = 37



Dielectric Constant = 90

