SCHOTT GHz 33 glass-ceramic

Glass-ceramic dielectric for microwave electronics

Cut blanks of SCHOTT GHz 33 glass-ceramic

Product Information

SCHOTT GHz 33 glass-ceramic is a high performance dielectric material for applications in antenna and filter elements. It offers an excellent material homogeneity and its completely pore free structure allows metallic structures with excellent electrical properties. As a GHz dielectric material SCHOTT GHz 33 glass-ceramic is based on a novel material class: a bulk glass-ceramic.

Advantages

SCHOTT GHz 33 glass-ceramic allows to design highly accurate resonating and radiating structures in antenna and filter applications:

- Miniaturization of antenna and filter structures due to a dielectric constant of ε' = 34.4 (@ 1MHz) and 32.2 (@ 1GHz)
- Low loss material
- High material homogeneity, derived from optical glass production allows highly accurate designs with MHz accuracy in GHz applications.
- Intrinsic pore free structure gives superior metallization properties

SCHOTT GHz 33 glass-ceramic is the dielectric for antenna and filter elements in microwave electronic. Its high homogeneity allows for accurate designs of resonating structures and its intrinsic pore free nature makes superior metal to dielectric interfaces.

About SCHOTT

SCHOTT is an international technology group with more than 130 years of experience in the areas of specialty glasses and glass-ceramics. More than 600 scientists and engineers are working for and with SCHOTT customers all over the world, while setting the pace by developing new, cutting edge technologies for the requirements of today and tomorrow.

SCHOTT
glass made of ideas

SCHOTT GHz 33 glass-ceramic

Glass-ceramic dielectric for microwave electronics

Quantity	Value/Unit	Remark	Measurement
Dielectric constant, ε	34.4	at 1 MHz	Dielectric spectroscopy
Dielectric loss, tan δ	$2.0 \cdot 10^{-4}$	at 1 MHz	
Dielectric constant, ε	33.6	at 27 MHz	Interpolated values
Dielectric loss, tan δ	$2.6 \cdot 10^{-4}$	at 27 MHz	
Dielectric constant, ε	32.2	at 1-15 GHz	Dielectric resonance spectroscopy
Dielectric loss, tan δ	$5.5 \cdot 10^{-4}$	at 1.1 GHz	
Quality factor, Q	1818	at 1.1 GHz	
Q f	1954 GHz	at 1.1 GHz	
Dielectric loss, tan δ	$6.7 \cdot 10^{-4}$	at 1.8 GHz	
Quality factor, Q	1493	at 1.8 GHz	
Q f	2754 GHz	at 1.8 GHz	
Dielectric loss, tan δ	$1.1 \cdot 10^{-3}$	at 4.7 GHz	
Quality factor, Q	893	at 4.7 GHz	
Q f	4208 GHz	at 4.7 GHz	
Dielectric loss, tan δ	$1.6 \cdot 10^{-3}$	at 7.2 GHz	
Quality factor, Q	644	at 7.2 GHz	
Q f	4647 GHz	at 7.2 GHz	
Dielectric loss, tan δ	$1.6 \cdot 10^{-3}$	at 8.5 GHz	
Quality factor, Q	611	at 8.5 GHz	
Q f	5211 GHz	at 8.5 GHz	
Dielectric loss, tan δ	$2.0 \cdot 10^{-3}$	at 12 GHz	
Quality factor, Q	493	at 12 GHz	
Q f	5965 GHz	at 12 GHz	
Temperature coefficient of resonance, τ_f	64 ppm/K	at 7.2 GHz	
Material homogeneity Δε/ε	< 0.1 %		
Residual porosity	none		
Knoop hardness	953		
E-modulus	162 GPa		
Shear modulus	63 GPa		
Density	4.67 g/cm³		
Poisson number, ν	0.28		
Available dimensions	Thickness: 0.2 mm – 23 mm Diameter of round cylinders: 0.5 mm – 115 mm Maximum size of blocks: 115 mm x 300 mm		

Important notice:
Listed measured values are from development samples.
Production samples may have different values or property combinations.

Further properties:
Excellent metal adhesion

ENGLISH 07/2023 kn/nino Printed in Germany

schott.com

Research & Development, Dr. Martin Letz
Phone +49 (0)6131/66-3539, martin.letz@schott.com

SCHOTT
glass made of ideas