

Lanthanum Gallium Silicate (LGS)

Introduction:

Langasite crystal ($\text{La}_3\text{Ga}_5\text{SiO}_{14}$, LGS) belongs to the intergroup P321, point group 32 and has been reported as a promising new piezoelectric material for fabricating surface acoustic wave (SAW) and bulk surface wave (BAW) devices. At the same time, LGS crystals can be used to make electro-optical Q-switches. Devices based on LGS crystals have high thermal stability.

Main Advantages:

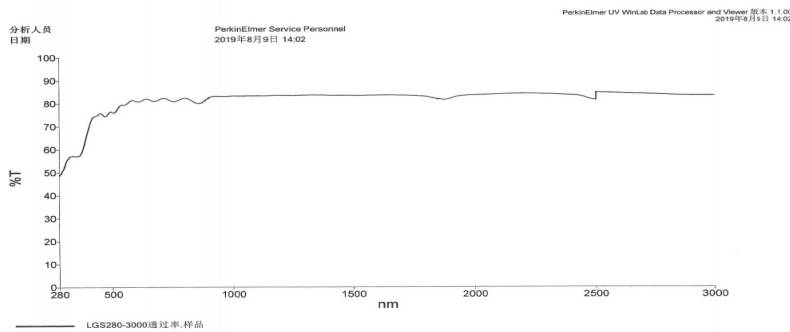
- ✧ High thermal stability
- ✧ Low Equivalent Series Resistivity
- ✧ Electro-mechanical coupling coefficient is 3-4 times that of quartz

Typical applications:

- ✧ Electro-optical tuning Q switch, acoustic surface wave filter, body acoustic wave filter, resonator, optical gyroscope etc.



Transmission Curve:



Material Properties:

Chemical Formula	$\text{La}_3\text{Ga}_5\text{SiO}_{14}$
Crystal Structure	Trigonal system, group33
Growth Method	Czochralski
Hardness	6.6 Mohs
Density	5.754g/cm^3
Melting Point	1470°C
Dielectric Constant	$\epsilon_{11}=18.27$; $\epsilon_{33}=55.26$
Thermal Expansion Coefficient	$\alpha_{11}=5.15 \times 10^{-6}/\text{K}$; $\alpha_{33}=3.65 \times 10^{-6}/\text{K}$
E-M coupling Coefficient K (%)	0.28 ~ 0.46
Piezoelectric Strain Constant (10^{-12}) C/N	$d_{11}=6.3$; $d_{14}=-5.4$

Size	2"; 3"; 10*10*0.5
Thickness Tolerance	$\pm 0.02\text{mm}$
Orientation	$\pm 0.2^\circ$, Y, Z, (0,138.5,27)
Parallelism	$< 30''$
Perpendicularity	$< 15'$
Flatness	$< \lambda/10@633\text{nm}$
Chamfer	$< 0.1\text{mm}@45^\circ$
Surface Quality	10-5