Standard specifications of 2 inch / 100 mm Sn-doped β-Ga_2O_3 (001) substrates

Items		Specifications	
Orientation		(001)	
Dopant		Sn	
Conductivity		n-type	
Resistivity (Ω・cm)		0.007–0.042	
Dimensions	Size	2 inch	100 mm
	Diameter (mm)	50.8 ± 0.3	100 ± 0.5
	Orientation flat width (mm)	15.9 ± 2.5	32.5 ± 2.5
	Index flat width (mm)	8.0 ± 2.5	18.0 ± 2.5
	Thickness (μm)	650 ± 20	
	Reference	Fig. 1	
Offset angle (degree)		[010]: 0 ± 1	
		[100]: 0 ± 1	
XRD FWHM (arcsec)		[010]: ≤ 50	
		[100]: ≤ 50	
Surface	Front	CMP	
	Back	CMP	

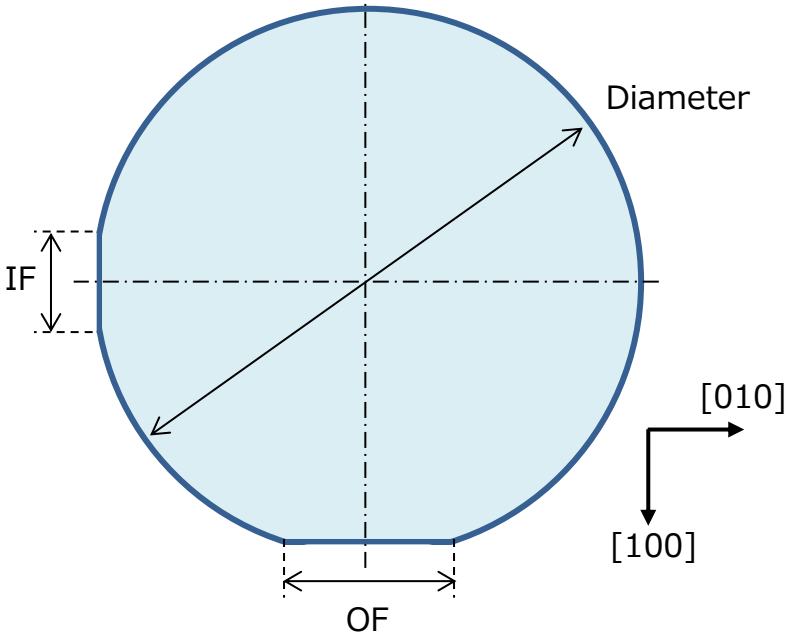

Fig. 1

Remarks
1 Chipping may occur within the following limits:
2 inch: < 8 mm (opposite OF), < 15.9 ± 2.5 mm (OF side); 100 mm: < 18 mm (opposite OF), < 32.5 ± 2.5 mm (OF side).
2 These products must be used for research and development purposes only.
3 The substrates must not be used as a seed crystal.
4 The specifications are subject to change without notice.

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Specifications of 150 mm Sn-doped β-Ga_2O_3 (001) substrate

Tentative

Items		Specifications
Orientation		(001)
Dopant		Sn
Conductivity		n-type
Resistivity (Ω·cm)		0.007–0.042
Dimensions	Diameter (mm)	150 ± 0.5
	Orientation flat width (mm)	57.5 ± 2.5
	Index flat width (mm)	32.5 ± 2.5
	Thickness (μm)	670 ± 20
	Reference	Fig. 2
Offset angle (degree)		[010] : 0 ± 1
		[100] : 0 ± 1
XRD FWHM (arcsec)		[010] : ≤ 50
		[100] : ≤ 50
Surface	Front	CMP
	Back	CMP

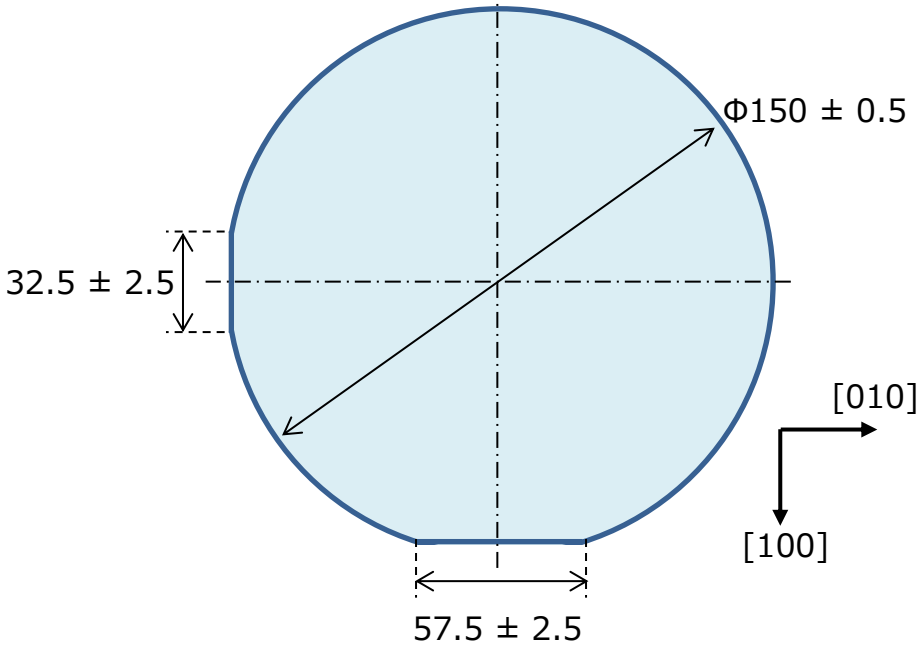

Fig. 2

Remarks
1 Chipping may be up to <32.5 mm on the opposite side of the OF, and <57.5 ± 2.5 mm on the OF side.
2 These products must be used for research and development purposes only.
3 The substrates must not be used as a seed crystal.
4 The specifications are subject to change without notice.

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Standard specifications of 10 × 15 mm² β-Ga_2O_3 (010) substrates

Items		Specifications		
Orientation		(010)		
Dopant		Sn	Undoped	Fe
Conductivity		n-type	n-type	Insulating ($> 10^{10}\Omega \cdot cm$)
N_d-N_a (cm^{-3})		1×10^{18}–9×10^{18}	$\leq 9\times10^{17}$	-
Dimensions	A-B (mm)	15 ± 0.3	15 ± 0.3	15 ± 0.3
	C-D (mm)	10 ± 0.3	10 ± 0.3	10 ± 0.3
	Thickness (μm)	500 ± 20	500 ± 20	500 ± 20
	Reference	Fig. 3	Fig. 3	Fig. 3
Offset angle (degree)		⊥[102]: 0 ± 1	⊥[102]: 0 ± 1	⊥[102]: 0 ± 1
		[102]: 0 ± 1	[102]: 0 ± 1	[102]: 0 ± 1
XRD FWHM (arcsec)		⊥[102]: ≤ 150	⊥[102]: ≤ 150	⊥[102]: ≤ 150
		[102]: ≤ 150	[102]: ≤ 150	[102]: ≤ 150
Surface	Front	CMP	CMP	CMP
	Back	Grinding	Grinding	Grinding

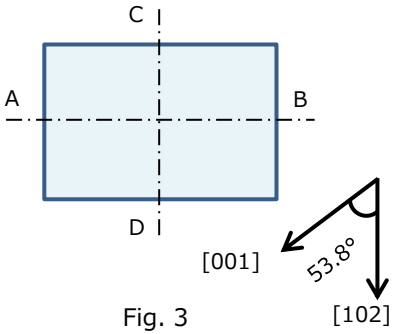

Fig. 3

Remarks

1 These products must be used for research and development purposes only.
2 The substrates must not be used as a seed crystal.
3 The specifications are subject to change without notice.

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Standard specifications of 2 inch β-Ga_2O_3 (-201) substrates

Items		Specifications		
Orientation		(-201)		
Dopant		Sn	Undoped	Fe
Conductivity		n-type	n-type	Insulating ($> 10^{10}\Omega \cdot cm$)
N_d-N_a (cm^{-3})		1×10^{18}–2×10^{19}	$\leq 9\times10^{17}$	-
Dimensions	Diameter (mm)	50.8 ± 0.3	50.8 ± 0.3	50.8 ± 0.3
	Orientation flat width (mm)	15.9 ± 2.5	15.9 ± 2.5	15.9 ± 2.5
	Thickness (μm)	680 ± 20	680 ± 20	680 ± 20
	Reference	Fig. 4	Fig. 4	Fig. 4
Offset angle (degree)		[010]: 0 ± 0.4	[010]: 0 ± 0.4	[010]: 0 ± 1
		[102]: -0.7 ± 0.4	[102]: -0.7 ± 0.4	[102]: -0.7 ± 1
XRD FWHM (arcsec)		[010]: ≤ 150	[010]: ≤ 150	[010]: ≤ 150
		[102]: ≤ 150	[102]: ≤ 150	[102]: ≤ 150
Surface	Front	CMP	CMP	CMP
	Back	Grinding	Grinding	Grinding

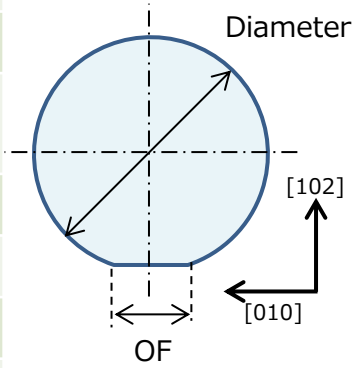

Fig. 4

Remarks
1 There are cases in which the opposite side of OF is chipped less than 8 mm.
2 There are cases in which the OF side is chipped less than 15.9 ± 2.5 mm.
3 These products must be used for research and development purposes only.
4 The substrates must not be used as a seed crystal.
5 The specifications are subject to change without notice.

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Standard specifications of β-Ga_2O_3 (100) substrates

Items		Specifications
Orientation		(100)
Dopant		Sn, Undoped, Fe
Dimensions	A-B (mm)	-(Typical: 20–23)
	C-D (mm)	-(Typical: 10)
	Thickness (μm)	-(Typical: 200–1000)
	Reference	Fig. 5
Surface	Front	Cleavage
	Back	Cleavage

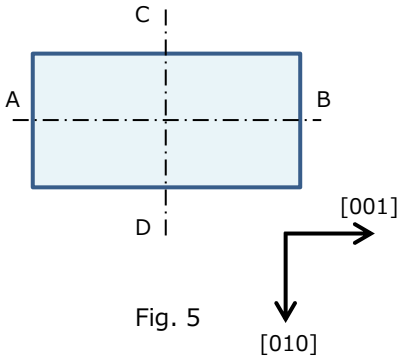

Fig. 5

Remarks

1 These products must be used for research and development purposes only.
2 The substrates must not be used as a seed crystal.
3 The specifications are subject to change without notice.

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Standard specifications of 10×15 mm² β-Ga_2O_3 (011) substrates

Items		Specifications	
Orientation		(011)	
Dopant		Sn	Fe
Conductivity		n-type	Insulating (>10^{10}Ω・cm)
N_d-N_a (cm^{-3})		2×10^{18}–2×10^{19}	-
Dimensions	A-B (mm)	15 ± 0.3	15 ± 0.3
	C-D (mm)	10 ± 0.3	10 ± 0.3
	Thickness (μm)	500 ± 20	500 ± 20
	Reference	Fig. 6	Fig. 6
Offset angle (degree)		[100]: 0 ± 1	[100]: 0 ± 1
		⊥[100]: 0 ± 1	⊥[100]: 0 ± 1
XRD FWHM (arcsec)		[100]: ≤ 150	[100]: ≤ 150
		⊥[100]: ≤ 150	⊥[100]: ≤ 150
Surface	Front	CMP	CMP
	Back	Grinding	Grinding

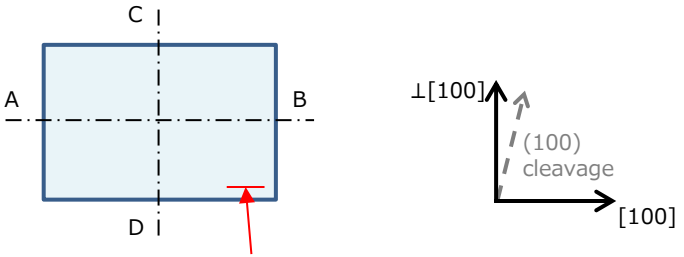

Fig. 6

Remarks

1 These products must be used for research and development purposes only.
2 The substrates must not be used as a seed crystal.
3 The specifications are subject to change without notice.

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