

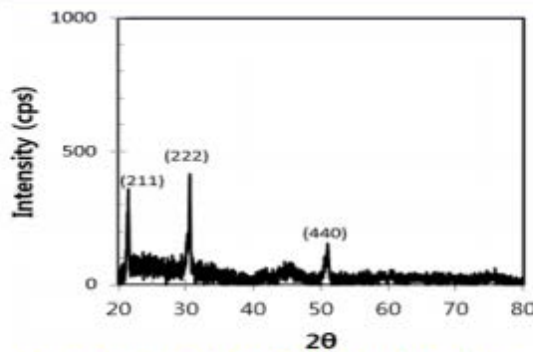
Transparent ITO film



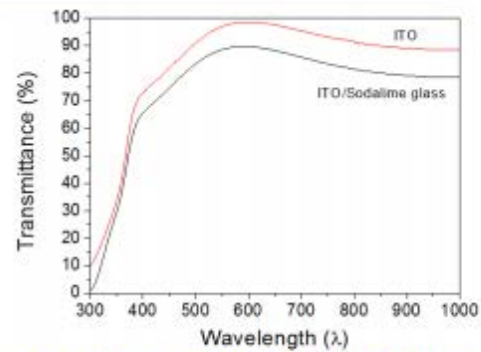
Features

- High transparency: $\geq 88\%$
- Flat and smooth surface
- Low electrical resistivity
- Film color: Pale yellow

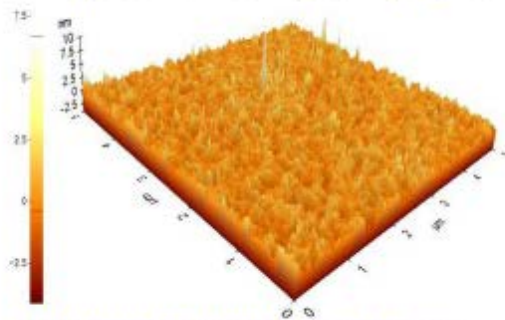
Items	Data (typical)	Remark
Substrate Type	Glass, Si	• Film thickness and substrate type can be changeable according to customer's request.
Film Thickness Range	100-300 nm	• Glass size (max.): 200 x 200 mm • Si wafer (max.): $\phi 12$ inch (= $\phi 300$ mm)
Optical Transmittance	$\geq 88\%$	@thickness: 150nm & λ : 550 nm
Film Crystallinity	Poly crystal	(222), (211), (440)
RMS Roughness	$< 10 \text{ \AA}$	@thickness: 150
Sheet Resistance	20, 12 ohm/ \square	@thickness: 150, 300 nm



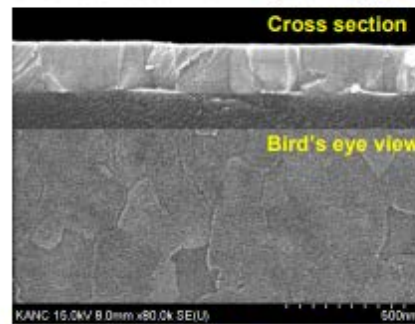
XRD spectrum of ITO film(150 nm) on glass



Transmittance of ITO film(150 nm)/glass



AFM image of ITO film(150 nm) on glass



SEM micrograph of ITO film(150 nm)/glass

Transparent ZnO film



Features

- High Transparency: 89%
- Highly C-axis orientation
- Flat and smooth surface
- Film color: Pale brownish yellow

Items	Data (typical)	Remark
Substrate Type	Glass, Si	• Film thickness and substrate type can be changeable according to customer's request.
Film Thickness Range	50-200 nm	• Glass size (max.): 200 x 200 mm • Si wafer (max.): ϕ 12 inch (= ϕ 300 mm)
Film Crystallinity	C-axis	Highly (002) orientation
RMS Roughness	< 10Å	
Optical transmittance	89%	@Thickness: 150 nm & λ : 550nm
Film Resistance	> $10^{12} \Omega$	Insulator

