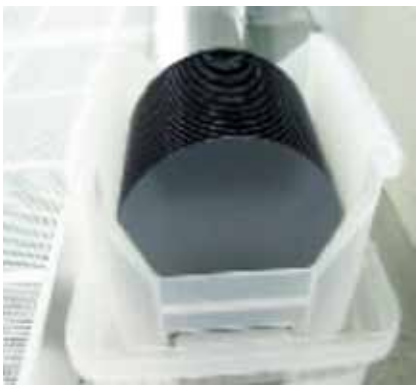
Silicon Epitaxial Wafer

Based on advanced technology and precise manufacture, the products of NEDITEK cover various types of silicon wafer from 4 inch to 8 inch and they are widely used in semi-conductor integrated circuits and devices. The present production capacity of NEDITEK is up to 250,000.00 pieces of silicon wafers (6 inch) per month. The main products are as follows: power MOSFET wafer, schottky diode wafer, IGBT wafer, microwave and millimeter-wave wafer, power transistor wafer and IC buried layer wafer.

NO.	Parameter	Values			
1	Dopant	P: Boron N: Phosphorus			
2	Orientation	<100>, <111>			
3	Resistivity	P, N: 0.01 ~ 80Ω · cm			
4	Resistivity Radial Gradient	Reactor	Range	WIW	WTW
		LPE3061	0.01-10	2.5%	3.5%
			10-30	4%	5%
		ASM2000	0.01-3	2%	2%
			3-30	2%	3%
5	Thickness	1 ~ 150 μm			
6	Thickness Radial Gradient	Reactor	Range	WIW	WTW
		LPE3061	1-100	1%	2%
		ASM2000	1-100	0.5%	1%
7	Stacking Faults	<10/cm^2			

- Power MOSFET Wafer
- Schottky Diode Wafer
- IGBT Wafer
- Microwave and Millimeter-wave Wafer
- Power Transistor Wafer
- IC Buried-layer Wafer



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GaAs Epitaxial Wafer

Items		HEMT	HFET	PHEMT	Customized products
Diameter (inch)[1]		2-6			
Substate		GaAs(001)			
Defects (>0.8μm)		<20cm^{-2}			
Dopping	Dopant	Silicon			
	Concentration	1E16 ~1E19cm^{-3}			
	Doping Tolerance	±15%			
	Doping Uniformity	≤2%			
Mobility (cm^2/Vs)[2]		>5000	>2000	>4000	-
In Composition[3]		-	-	≤30%	-
Composition Tolerance[3]		±5%			
Uniformity[4]		≤3%			

Note:

1) 3 mm edge exclusion for 2 and 3 inch; 5 mm edge exclusion for 4 and 6 inch;
2) Net doping density is determined as an average value across the whole wafer by Hall measurement (5 pts);
3) Thickness and composition is determined as an average value across the wafer by HRXRD (5 pts);
4) All uniformities are measured by Lehighton;
5) Contact NEDITEK for specifications on multi-layer or unique epitaxy requests.

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AlGaN/GaN HEMT Epi Wafer

HEMT Structure	$Al_xGa_{1-x}N$ / AlN / GaN		$Al_xGa_{1-x}N$ / GaN		$Al_xGa_{1-x}N$ / AlN / GaN / $Al_yGa_{1-y}N$	
Substrate	On-axis SiC, (0001) Si-face					
$Al_xGa_{1-x}N$ Dopant	Undoped					
Al Composition	x≤0.4					
Diameter	3 inch	4 inch	3 inch	4 inch	3 inch	4 inch
2DEG Mobility[1)]	≥1800^{-2}/Vs		≥1400^{-2}/Vs		≥1400^{-2}/Vs	
2DEG Concentration	>8.0E12/cm^2 (0.25Al / 25nm $Al_xGa_{1-x}N$)		>6.0E12/cm^2 (0.25Al / 25nm $Al_xGa_{1-x}N$)		>7.0E12/cm^2 (0.25Al / 25nm $Al_xGa_{1-x}N$, GaN thickness 100 nm)	
Sheet Resistance Uniformity[2)]	≤3%	≤5%	≤5%	≤5%	≤3%	≤5%
$Al_xGa_{1-x}N$ Thickness Tolerance (nm)	±1.5		±1.5		±1.5	
Al Composition Tolerance	±0.015		±0.015		±0.015	
Wafer Warp (μm)	≤35	≤40	≤35	≤40	≤40	≤45
GaN Buffer Crystallinity (arcsec.)	≤250	≤300	≤250	≤300	≤300	≤350
RMS (μm) (5μm x 5μm)	≤1		≤1		≤1	
Edge Exclusion (mm)	3	5	3	5	3	3
Surface Particales (cm^{-2})[3)]	≤20		≤20		≤20	

Note:

1) 2DEG concentration/mobility and sheet resistance are determined by Contactless non-destructure measurement.
2) All uniformities are calculated by standard deviation (σ)/average.
3) The size of surface particles is larger than 0.8 micrometer.
4) Contact NEDITEK for specifications on multi-layer or unique epitaxy requests.

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SiC Epitaxial Wafer

Standard Specifications for SiC Epitaxial Wafer 76.2 mm and 100mm Substrates

Substrate Orientation: Epitaxy is only available for off-axis substrates				
Conductivity	n-type		p-type	
Dopant	Nitrogen		Aluminum	
Net Doping Density	N_D -N_A		N_A -N_D	
Si-face	8E14 ~ 2E19/cm^3		5E15 ~ 2E19/cm^3	
Tolerance	± 25% (Spec.)	±15% (Typical)	± 25% (Spec.)	±15% (Typical)
Uniformity	≤ 10% (Spec.)	≤ 7% (Typical)	≤ 10% (Spec.)	≤ 7% (Typical)
Thickness Range				
0.2-20.0 microns	± 15% of selected thickness		± 15% of selected thickness	
20.0-50.0 microns	± 10% of selected thickness		± 10% of selected thickness	
Uniformity	≤ 4%		≤ 4%	

Characteristics	Maximum Acceptability Limits		Test Methods	Defect Den Tions
Large Point Defects	10		Diffuse Illumination	Defects which exhibit a clear shape to the unassisted eye and are > 50 microns across. These features include spikes, adherent particles, chips and craters.
Scratches	10 lines < 2×wafer diameter			Grooves or cuts below the surface plane of the wafer having a length-to-width ratio of greaterthan 5 to 1.
Step Bunching	4.0° off-axis	NA		Step bunching is visible as a pattern of parallel lines running perpendicular to the major.
	8.0° off-axis	<10% affected		
Backside Cleanliness				Verified by inspecting for a uniform color to the Backside Cleanliness wafer backside.
Edge Chips	2 with radius 1.5 mm			Areas where material has been unintentionally removed from the wafer.
Surface Roughness	< 0.5 nm		AFM	10μm×10μmscan
Epi Defects	5/cm^2		Microscopic	3C inclusions, comet tails, carrots, particles and silicon droplets.
Net Doping	See Specification Table		Hg Probe CV	-
Thickness	See Specification Table		FTIR	-

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