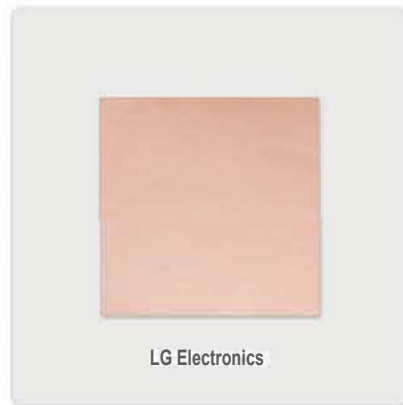


## Graphene Film

Graphene on Copper foil



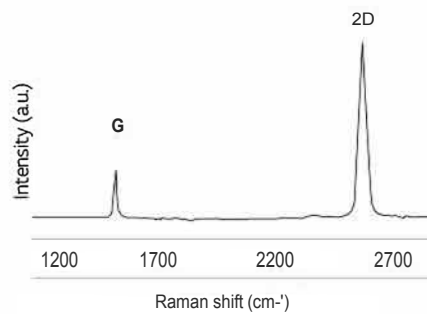
- \* AS Sheet (150 mm X 210 mm)
- \* AS Roll (150 mm X 840 mm)

Growth Method	R2R CVD
Cu Foil Thickness	35µm
Graphene Layer	Monolayer
Coverage	> 97%
Transmittance	> 97%
Sheet Resistance	2700/sq
Mobility	3,000 cm <sup>2</sup> / Vs
Grain size	5µm <sup>2</sup> / 110 µm <sup>2</sup>

- Sheet Resistance : Graphene on PET film
- Mobility : Hall Effect Measurement

## Characterization

Raman - Crystal Quality

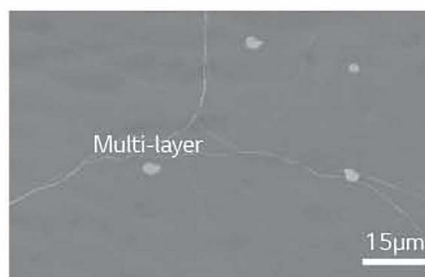


SEM - Grain Size



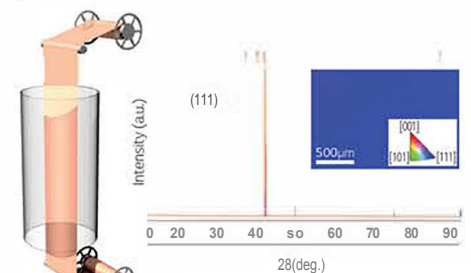
Average Size : >110 µm<sup>2</sup>

OM - Layer Uniformity



Number of Multi-layer graphene < 30 ea / 100 µm X 100 µm

EBSD / XRD - Crystallinity



Control (111) orientation

## Graphene Film

Graphene on SiO<sub>2</sub>/ Si wafer



\* 4" / 6" / 8" Wafer

Growth Method	R2R CVD
Substrate	SiO <sub>2</sub> (300 nm)/ Si
Graphene Layer	Monolayer
Coverage	> 97%
Transmittance	> 97%
Mobility	3,000 cm <sup>2</sup> / Vs
Grain size	5 μm <sup>2</sup> / 110 μm <sup>2</sup>
Transfer	Wet Process

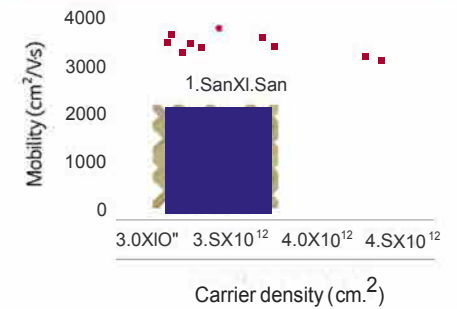
- Sheet Resistance : Graphene on PET film
- Mobility : Hall Effect Measurement

## Characterization

OM Image - Monolayer Graphene



Hall Effect Measurement



Substrate	
Type/ Dopant	P/ Boron
Orientation	<100>
Thickness	525±25 μm
Resistivity	< 0.005 0-cm
Oxide Thickness	3,000Å

Comparison of Field Effect Mobility"		
	VTT	GIST
LG	10,000	2,000
Commercial	2,500	1,200
Mobility(cm <sup>2</sup> / V-s)		

- Announced In 2019
- VTT Technical Research Center of Finland
- Gwangju Institute of Science Technology(Korea)