

## Technical Datasheet

# Graphene Field-Effect Transistor Chip: S12

### General Description

The GFET chip from Graphenea delivers state-of-the-art graphene devices directly to the researcher to allow application-driven research without the added burden of having to fabricate high-quality devices.

The GFET-S12 chip from Graphenea provides 27 graphene devices distributed in a grid pattern on the chip. The devices have interdigitated contacts on top of the graphene channel, which are optimal for sensing of gases and volatile compounds. All the devices have the same channel length (1mm), but 3 different widths (50 $\mu$ m, 100 $\mu$ m and 200 $\mu$ m). The interdigitated contacts have 3 different gaps (8 $\mu$ m, 15 $\mu$ m and 25 $\mu$ m). These different graphene channel dimensions allow investigation of geometry dependence on device properties, enabling immediate device optimization.

#### Features

- State-of-the-art GFETs utilizing Graphenea's established consistently high-quality graphene
- Devices not encapsulated ready for your functionalization
- Perfect platform device for new sensor research and development
- 27 individual GFETs per chip
- Mobilities typically in excess of 1000 cm<sup>2</sup>/V·s

#### Applications

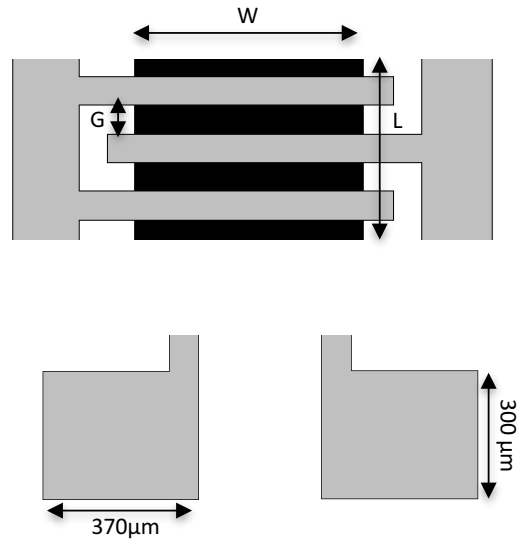
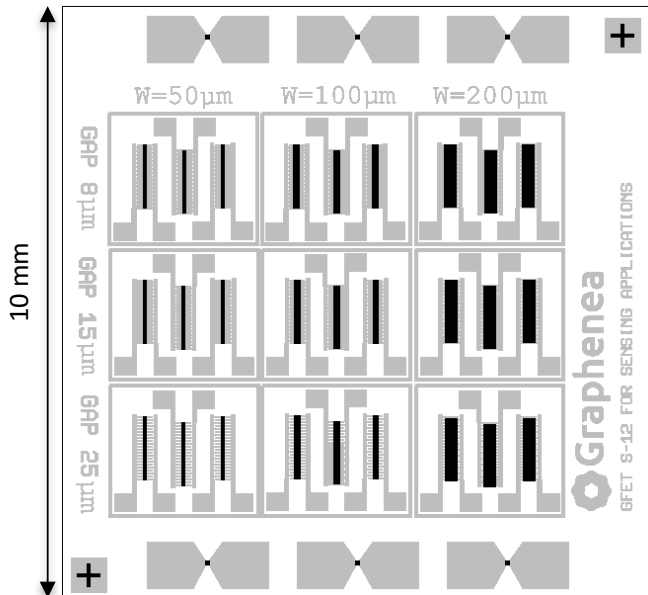
- Graphene device research
- Quantum transport
- Gas sensors
- Chemical sensors

### Typical Specifications

Chip dimensions	10 mm x 10 mm
Chip thickness	675 $\mu$ m
Number of GFETs per chip	27
Gate Oxide thickness	90 nm
Gate Oxide material	SiO <sub>2</sub>
Resistivity of substrate	1-10 $\Omega$ ·cm
Metallization	Chromium/Gold 5/45 nm
Graphene field-effect mobility	> 1000 cm <sup>2</sup> /V·s
Dirac point	< 50 V
Yield	> 75 %

### Absolute Maximum Ratings

Maximum gate-source voltage	$\pm$ 50 V
Maximum temperature rating	150 °C
Maximum drain-source current density	10 <sup>7</sup> A·cm <sup>-2</sup>

**GFET-S12 Layout**

**Channel geometries**

Grid description	W (µm)	G (µm)	L (µm)	Quantity
Top left	50	8	1000	3
Top center	100			
Top right	200			
Center left	50	15	1000	3
Center	100			
Center right	200	25	1000	3
Bottom left	50			
Bottom center	100			
Bottom right	200			

**Typical characteristics**

Averaged output curves of 27 devices for the 3 different electrode gaps. Source-drain voltage of 20mV, measured at room temperature and vacuum conditions.

