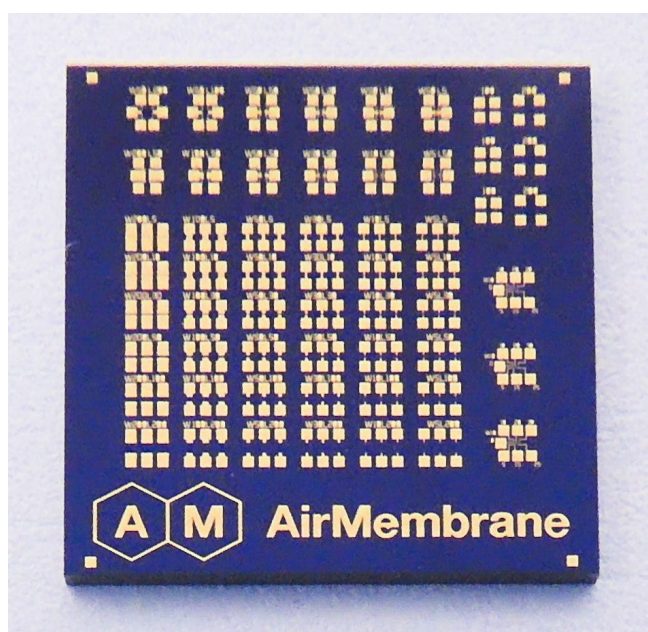


Graphene Field-Effect Transistor **FR01**

FR01 is a graphene Field Effect Transistor (FET) chip made from highly clean chemical vapor deposition (CVD) graphene and advanced transfer and device fabrication technology. This FET chip is ideal for usages such as developing various sensors using graphene and confirming the potential of graphene by measuring electrical characteristics. It is back-gate type FET which uses a low-resistance silicon substrate as the gate electrode. Four types of devices, two-terminal, vdP, Hall bar, and TLM, with single-layer graphene as the channel material, are incorporated in a chip of 10mm x 10mm. Since graphene channel is not encapsulated, experiments such as functional modification can be performed.

Applications: Development of graphene devices, chemical sensors, gas sensors, magnetic sensors, etc.

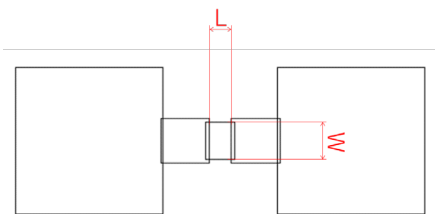


Chip size	10mm×10mm
Gate oxide material, thickness	SiO ₂ , 100nm
Substrate material, thickness, resistivity	Si, 525μm, <10Ωcm
Electrode metal	Au
Dirac point	<30V
Mobility	>1000cm ² /Vs
Devices	Two-terminal, vdP, Hall bar, TLM



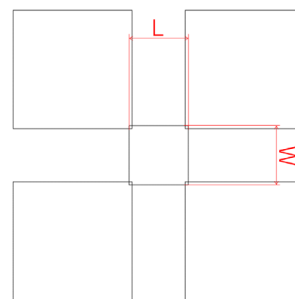
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Two-terminal



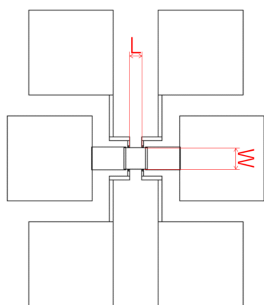
W [μm]	L [μm]	Quantity
5	5, 10, 30, 50, 100, 200	3 each
10	5, 10, 30, 50, 100, 200	3 each
30	5, 10, 30, 50, 100, 200	3 each
50	5, 10, 30, 50, 100, 200	3 each
100	5, 10, 30, 50, 100, 200	3 each
200	5, 10, 30, 50, 100, 200	3 each

vdP



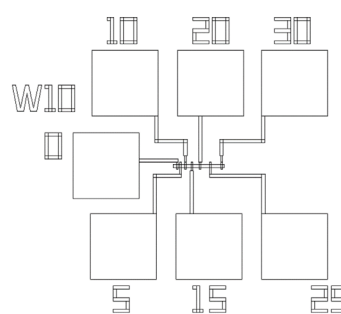
W [μm]	L [μm]	Quantity
100	100	3
200	200	3

Hall bar



W [μm]	L [μm]	Quantity
50	5, 10, 30, 50, 100, 200	1 each
5, 10, 30, 50, 100, 200	50	1 each

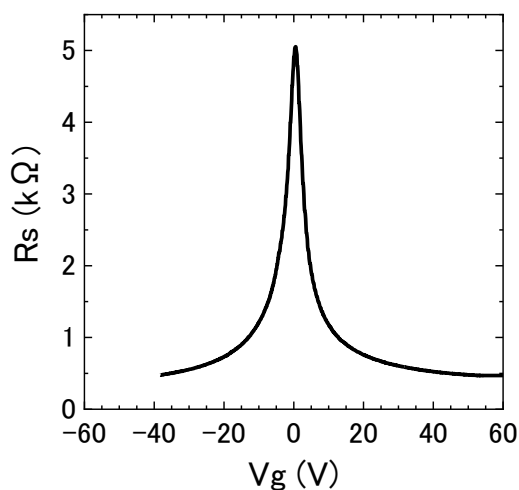
TLM



W [μm]	L [μm]	Quantity
10	5, 10, 15, 20, 25, 30	3

Typical characteristics (right figure)

Dependence of sheet resistance (R_s) on gate voltage (V_g) measured with vdP device ($W100\mu\text{m}$, $L100\mu\text{m}$) at room temperature in vacuum.



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