Supplementary Information

Stable and reversible doping of graphene by using KNO$_3$ solution and photo-desorption current response

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Figure S1. (a) The atomic force microscopic image of pristine CVD-grown graphene. (b) The thickness profile along the green line in (a). (c) SEM image of CVD-grown graphene channel in the device.
**Figure S2.** Zoom-in spectra of 2D band of pristine and doped graphene (Device-1) for different time.

**Figure S3.** Change of charge carrier density ($\Delta n$) as a function of treatment time for CVD-grown graphene (Device-1 & Device-2).
**Figure S4.** XPS spectra of CVD-grown graphene doped by KNO₃ solution for 20 min.

**Table 1.** The electron and hole mobilities of pristine, doped, after 2 month and annealed CVD-grown graphene (Device-4).

<table>
<thead>
<tr>
<th>Device-4</th>
<th>Pristine</th>
<th>Doped (20 min)</th>
<th>After 2 months</th>
<th>Annealed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electron mobility (cm²/Vs)</td>
<td>1304</td>
<td>2950</td>
<td>2782</td>
<td>896</td>
</tr>
<tr>
<td>Hole mobility (cm²/Vs)</td>
<td>1451</td>
<td>3024</td>
<td>2827</td>
<td>1303</td>
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