Electronic Supplementary Information

Enhancing the Efficiency and Stability of Inverted Perovskite Solar Cells
by Using 6-(trifluoromethyl)nicotinic Acid as Potent Defect Passivator

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\textbf{Fig. S1:} (a, b) SEM and (c, d) AFM micrograph of 1M and 3M modified perovskite film.
Fig. S2: FWHM and I(100)/I(PbI$_2$) ration value of the pristine and 2M perovskite film respectively.

Fig. S3: (a) Tauc plot and (b) Urbach tail energy of the pristine and 2M perovskite film.
**Fig. S4:** Full range FTIR spectra of the additive molecule and its mixture with (a) FAI and (b) PbI$_2$ precursors.

**Fig. S5:** (a) FTIR spectra of C=N stretching frequency of TFNA and TFNA+PbI$_2$ (b) $^1$H NMR spectra of the additive molecule and its mixture with MABr in DMSO-d$_6$ solvent.
Fig. S6: Statistical distribution of PCE, FF, V_{OC}, and J_{SC} respectively for a batch of 15 pristine as well as all modified devices.

Fig. S7: J-V curves of PSCs with different concentration of TFNA.
<table>
<thead>
<tr>
<th>Device</th>
<th>$J_{SC}$ (mA·cm$^{-2}$)</th>
<th>$V_{OC}$ (Volt)</th>
<th>FF (%)</th>
<th>PCE (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pristine</td>
<td>22.56</td>
<td>1.052</td>
<td>70.1</td>
<td>16.64</td>
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<tr>
<td>1M</td>
<td>23.20</td>
<td>1.090</td>
<td>74.7</td>
<td>18.88</td>
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<tr>
<td>2M</td>
<td>24.16</td>
<td>1.108</td>
<td>76.4</td>
<td>20.45</td>
</tr>
<tr>
<td>3M</td>
<td>22.80</td>
<td>1.109</td>
<td>73.8</td>
<td>18.66</td>
</tr>
</tbody>
</table>

**Table S1** Device parameters of pristine and different concentration of TFNA additive based PSC.