<table>
<thead>
<tr>
<th>GATE</th>
<th>DRAIN</th>
<th>REGION</th>
<th>FIRST ORDER BEHAVIOR</th>
<th>NOT EXACTLY:</th>
</tr>
</thead>
<tbody>
<tr>
<td>$V_{GS} &gt; V_{TH}$</td>
<td>$V_{DS} &gt; V_{GS} - V_{TH}$</td>
<td>SATURATION (ACTIVE)</td>
<td>DRAIN &quot;LOOKS LIKE&quot; CURRENT SOURCE; $I_D$ DEPENDS ONLY ON $V_{GS} - V_{TH}$</td>
<td>CHANNEL LENGTH MODULATION $I_D$ DEPENDS SOMEWHAT ON $V_{DS}$</td>
</tr>
<tr>
<td>$V_{GS} &gt; V_{TH}$</td>
<td>$V_{DS} &lt; V_{GS} - V_{TH}$</td>
<td>TRIODE</td>
<td>D-S CHANNEL &quot;LOOKS&quot; RESISTIVE $I_D = V_{DS} / R_{on}$  $R_{on}$ DEPENDS ON $V_{GS} - V_{TH}$</td>
<td>NONLINEAR AS $V_{DS}$ INCREASES $I_D = \frac{\mu n C_{ox} W}{L} \left[ \left( V_{GS} - V_{TH} \right) V_{DS} - \frac{V_{DS}^2}{2} \right]$</td>
</tr>
<tr>
<td>$V_{GS} &lt; V_{TH}$</td>
<td>$</td>
<td>V_{DS}</td>
<td>&lt; V_{bkd}$</td>
<td>CUTOFF</td>
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<tr>
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<td></td>
<td></td>
<td>BREAKDOWN IF $</td>
<td>V_{DS}</td>
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<td>SATURATION (ACTIVE)</td>
<td>DRAIN &quot;LOOKS LIKE&quot; CURRENT SOURCE; I_D DEPENDS ONLY ON V_{GS} - V_{TH} ( I_D = -\frac{\mu_p C_{ox} W}{2L} (V_{GS} - V_{TH})^2 )</td>
<td>CHANNEL LENGTH MODULATION ( I_D ) DEPENDS SOMEWHAT ON V_{DS} ( I_D = -\frac{\mu_p C_{ox} W}{2L} (V_{GS} - V_{TH})^2 [1 + \lambda</td>
</tr>
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<td>V_{DS} &gt; V_{GS} - V_{TH}</td>
<td>TRIODE</td>
<td>D-S CHANNEL &quot;LOOKS&quot; RESISTIVE ( I_D = V_{DS} / R_{on} ) ( R_{on} ) DEPENDS ON V_{GS} - V_{TH} ( R_{on} = \frac{1}{\mu_n C_{ox} W / L</td>
<td>V_{GS} - V_{TH}</td>
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<tr>
<td>V_{GS} &gt; V_{TH}</td>
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<td>CUTOFF</td>
<td>SWITCH &quot;OFF&quot; ( I_D = 0 )</td>
<td>I_D \approx pA to nA SUBTHRESHOLD CURRENT</td>
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<td></td>
<td></td>
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