ENABLE BEST RF PERFORMANCE BY SENSOR COMBINATION ALGORITHM

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Enable best RF performance by sensor combination algorithm

FCC/CE SAR is mandatory requirement for NB/tablet products, we need to reduce power to pass SAR spec, that also degrade RF performance, our mitigation plans can recover full RF performance to ensure our products with the best user experience.

Conventional Approach

Use proximity sensor pad around antenna, this is not only expensive solution but also hurt Screen to Body Ratio a lot, not to mentioned we can’t use this solution on premium ID, for example: slot antenna.

New Approach

This new approach can offer almost full RF performance, also can be adopted into any form factor and cost effective. Take tablet project as an example as below-

Use two hall sensors to know what mode we are using, once we confirm Clamshell/Stand/Ink mode, RF module output full power;

[Diagram of sensor positions in Clamshell, Stand, and Ink modes]
Once we detect flat/tablet/close lid mode, we reduce power, then monitor movement on unit, if confirm no movement, tablet can recover to full power to get the best performance.

**Flat mode**

<table>
<thead>
<tr>
<th>Soft Keyboard</th>
<th>Tablet</th>
</tr>
</thead>
</table>

**Table mode**

- Hall sensor to kickstand lower part magnet
- Hall sensor to kickstand magnet upper part and lid

<table>
<thead>
<tr>
<th>Operating Mode Definition</th>
<th>Trigger Mechanism and Lid Angle Description</th>
<th>Wireless Power</th>
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<tbody>
<tr>
<td>Lid Close Mode</td>
<td>Lid angle &lt; 10° Lid Hall Sensor triggered and soft keyboard attached</td>
<td>Reduced Power</td>
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<tr>
<td>Clamshell Mode/Stand mode</td>
<td>Hall sensor to kickstand upper part triggered and hall sensor to kickstand magnet released with soft keyboard attached</td>
<td>Full Power</td>
</tr>
<tr>
<td>Ink Mode</td>
<td>Hall sensor to kickstand upper part triggered and hall sensor to kickstand magnet released without soft keyboard attached</td>
<td>Full Power</td>
</tr>
<tr>
<td>Tablet Only</td>
<td>Detached soft keyboard</td>
<td>Reduced Power</td>
</tr>
</tbody>
</table>

**Motion detection**

- confirm no movement
- confirm tablet movement

**Disclosure**

Disclosed by Kun-Jung Wu, Richard Liu and Wallace Huang, HP Inc.