### Driver Precomp Proposal, Review

**Paul Aloisi - TI**

<table>
<thead>
<tr>
<th>Nominal Voltage</th>
<th>320</th>
<th>400</th>
<th>500</th>
<th>600</th>
<th>700</th>
<th>800</th>
<th>Millivolt drive</th>
</tr>
</thead>
</table>

No terminator tolerance factor in

No driver imbalance, matched assertion and negation

- **Driver fall back 15%**: 272 340 425 510 595 680 376.4706 mV
- **Driver fall back 25%**: 240 300 375 450 525 600 426.6667 mV
- **Driver Fall back 33%**: 211.2 264 330 396 462 528 484.8485 mV
- **Driver Fall Back 40%**: 192 240 300 360 420 480 533.3333 mV

### Worst case

**Cable roll off to 60% signal**

- **Trans FB 15% to assert (60%)**: 83.2 104 130 156 182 208 mV signal at the receiver minus cable loss
  - 70.72 88.4 110.5 132.6 154.7 176.8 15% cable loss, double counting?
- **Trans FB 25% roll off to 60%**: 96 120 150 180 210 240 mV signal at the receiver minus cable loss
- **Trans FB 33% roll off to 60%**: 107.52 134.4 168 201.6 235.2 268.8 mV signal at the receiver minus cable loss
- **Trans FB 40% roll off to 60%**: 115.2 144 180 216 252 288 mV signal at the receiver minus cable loss
  - 97.92 122.4 153 183.6 214.2 244.8 15% cable loss, double counting?

**80 mV @ receiver**

**60 mV noise/crosstalk**

- **140**
- **140**
- **140**
- **140**
- **Signal required with Noise + Crosstalk**

**100 mV @ receiver**

- **160**
- **160**
- **160**
- **160**
- **160 mV**

### Tolerance driver

Cable roll off to 60% signal

- **Trans FB min to assert (60%)**: 53.68 59.6 67 74.4 81.8 89.2 mV signal at the receiver minus cable loss
  - 45.628 50.66 56.95 63.24 69.53 75.82 15% cable loss, double counting?
- **Trans fb 25% roll off to 60%**: 66.48 75.6 87 98.4 109.8 121.2
- **Trans fb 33% roll off to 60%**: 78 90 105 120 135 150
- **Trans fb 40% roll off to 60%**: 85.68 99.6 117 134.4 151.8 169.2 mV signal at the receiver minus cable loss
  - 72.828 84.66 99.45 114.24 129.03 143.82 15% cable loss, double counting?

### Drive tolerance calculation

\[(0.69\cdot V)+50+Vfb \cdot 0.6)-Vfb\]

Signal at the receiver
0.60 is the roll off measure on systems.

\[ 0.60 \times (500 + 375) = 525 \]

\[ \frac{525}{150 \text{ mV}} \]
<table>
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<tr>
<th>SPI-3</th>
<th>320</th>
<th>400</th>
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<th>600</th>
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<th>Millivolt drive</th>
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</thead>
</table>

**Nominal Voltage**

<table>
<thead>
<tr>
<th>Driver fall back 0%</th>
<th>320</th>
<th>400</th>
<th>500</th>
<th>600</th>
<th>700</th>
<th>800</th>
<th>320 mV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Driver Fall Back 40%</td>
<td>192</td>
<td>240</td>
<td>300</td>
<td>360</td>
<td>420</td>
<td>480</td>
<td>533.3333 mV</td>
</tr>
</tbody>
</table>

**Driver Fall Back 40%**

<table>
<thead>
<tr>
<th>Trans min to assert (85%)</th>
<th>224</th>
<th>280</th>
<th>350</th>
<th>420</th>
<th>490</th>
<th>560 mV signal at the receiver minus cable loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trans fb max 85%</td>
<td>243.2</td>
<td>304</td>
<td>380</td>
<td>456</td>
<td>532</td>
<td>608 mV signal at the receiver minus cable loss</td>
</tr>
</tbody>
</table>

**Trans fb max 85%**

<table>
<thead>
<tr>
<th>80 mV @ receiver</th>
<th>140</th>
<th>140</th>
<th>140</th>
<th>140</th>
<th>140</th>
<th>140 mV</th>
</tr>
</thead>
<tbody>
<tr>
<td>60 mV noise</td>
<td>160</td>
<td>160</td>
<td>160</td>
<td>160</td>
<td>160</td>
<td>160 mV</td>
</tr>
</tbody>
</table>

**Tolerance driver**

<table>
<thead>
<tr>
<th>Driver fall back 0%</th>
<th>320</th>
<th>400</th>
<th>500</th>
<th>600</th>
<th>700</th>
<th>800</th>
<th>320 mV</th>
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<tbody>
<tr>
<td>Driver Fall Back 40%</td>
<td>192</td>
<td>240</td>
<td>300</td>
<td>360</td>
<td>420</td>
<td>480</td>
<td>533.3333 mV</td>
</tr>
</tbody>
</table>

**Cable roll off to 85% signal**

<table>
<thead>
<tr>
<th>Trans FB min to assert (85%)</th>
<th>182.18</th>
<th>217.1</th>
<th>260.75</th>
<th>304.4</th>
<th>348.05</th>
<th>391.7 mV signal at the receiver minus cable loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trans fb max 85%</td>
<td>201.38</td>
<td>241.1</td>
<td>290.75</td>
<td>340.4</td>
<td>390.05</td>
<td>439.7 mV signal at the receiver minus cable loss</td>
</tr>
</tbody>
</table>

**First step min 320 mV**

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<tr>
<th>Min high drive mV</th>
<th>560 mV</th>
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