

SR4/SR10 TP2 Mask Failure Due to Over Emphasis

September 21, 2009

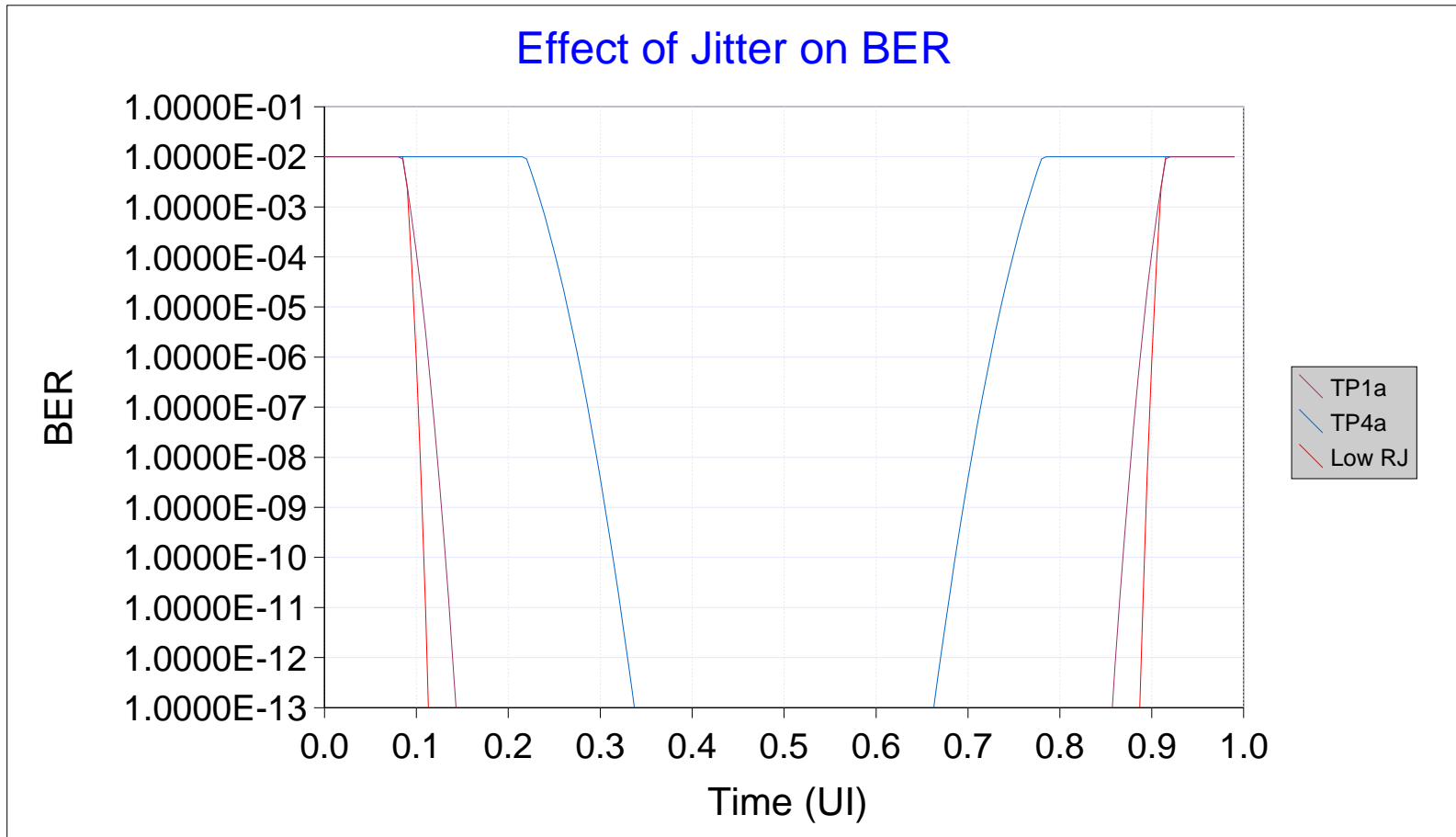
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Problem Statement

- **Over emphasis is expected to be a common practice in nPPI as the method to minimize DDPWS**
- **Current specifications at TP1a are $J_2=0.18$ UI and $J_9=0.26$**
- **The concern is that a transmitter with low RJ (<0.5 ps RMS) can have as much as 5 dB of over emphasis resulting in significant amount of eye distortion and still meet J_2**
 - **This amount of over emphasis may result in TP2 mask failure**
- **Current nPPI specifications does not limit over-emphasis by any direct method beside J_2 , the option to limit over emphasis are**
 - **Add limit for max DJJ the most direct method**
 - **Add limit for max over emphasis**

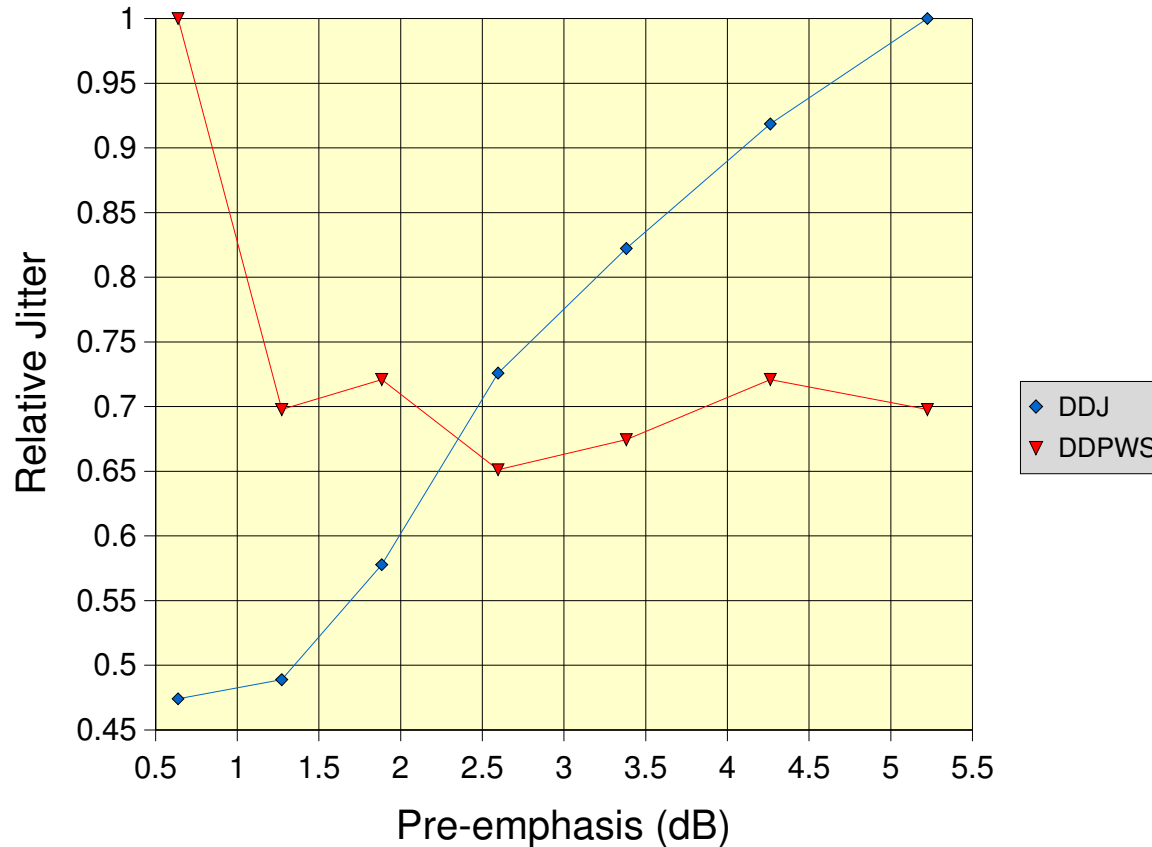
nPPI Bathtubs at TP1a and TP4a

- Lets consider TP1a host with high RJ and low RJ
 - Host with high RJ has $DJ \sim 0.11$ UI and ~ 1.14 ps, J2 is sufficient to control over emphasis
 - Host with low RJ has $DJ \sim 0.15$ UI and ~ 0.5 ps, J2 is not sufficient to control over emphasis

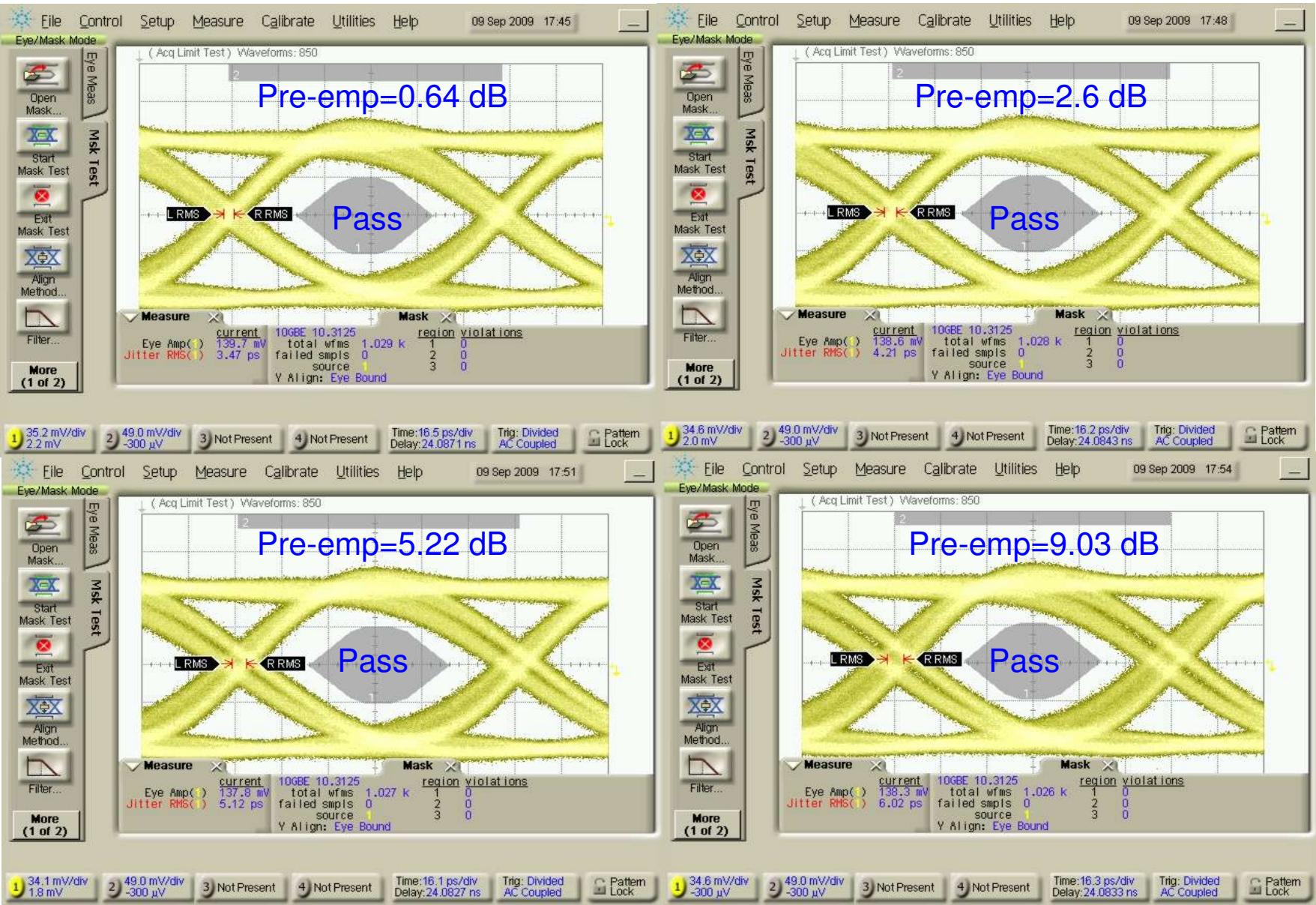


Relative DDJ and DDPWS at TP1a

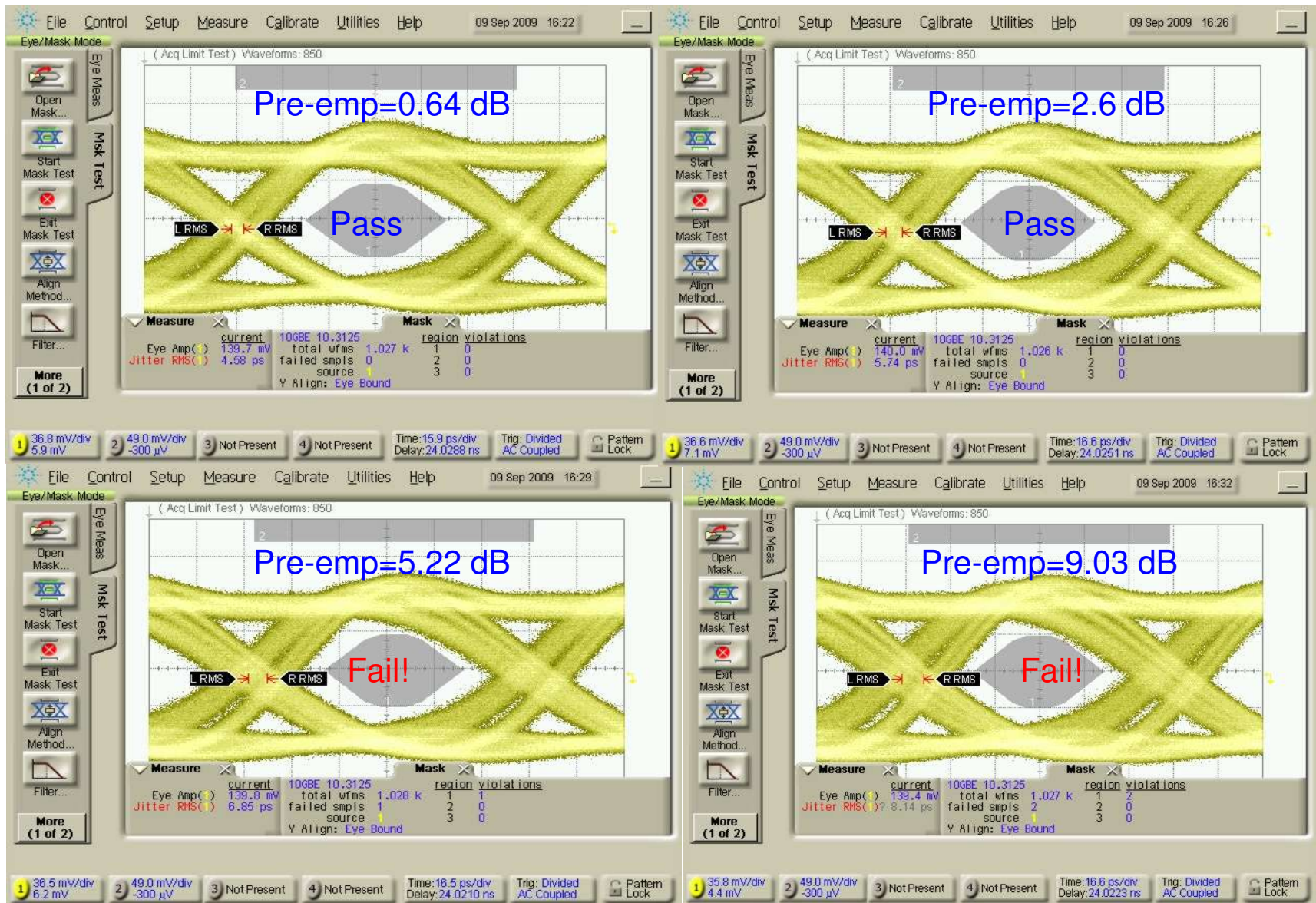
- **1.6” channel and pre-emphasis measured at TP1a**
 - J2 is compliant for max de-emphasis shown here



Module 1 TP2 Eye Mask Function of de-emphasis



Module 2 TP2 Eye Mask Function of de-emphasis



Options to Move Forward

- **Module 2 failed TP2 mask at 5.22 dB of over emphasis but passed nPPI specifications!**
 - J2 is not sufficient to limit over emphasis
 - TP1a mask is not sufficient to limit over emphasis
- **The options to close this gap are**
 - Define maximum over emphasis of 4 dB at TP1a
 - Or define maximum DDJ with value of 0.125 UI
- **The proposed options on the table are not a burden for typical host but will ensures any module and host combinations will result in TP2 compliance.**