



**Rosenberger**

802.3ch channel parameter study

Thomas Müller

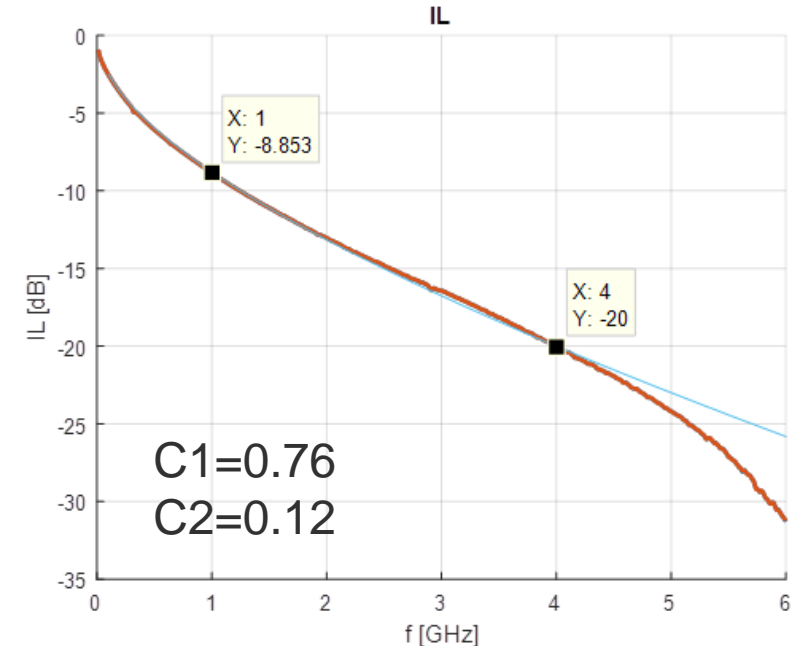
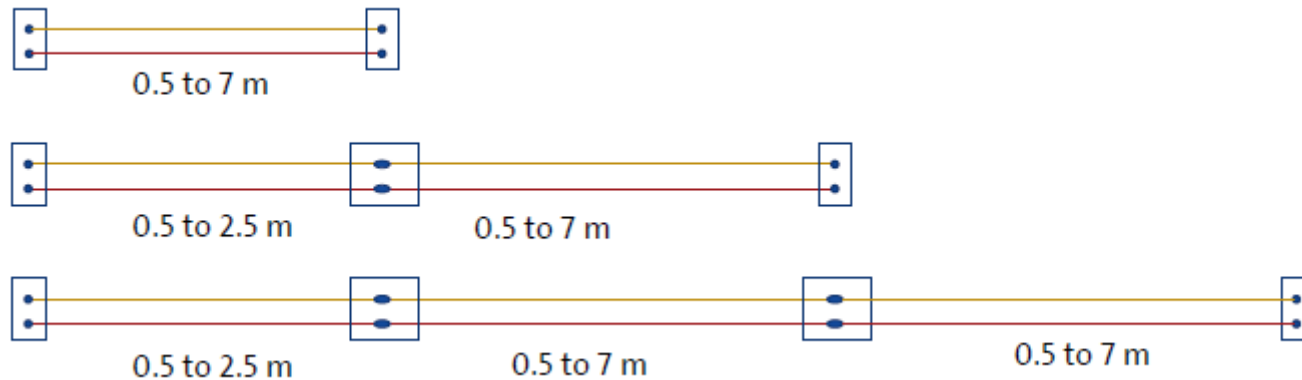
7th of March 2018



# 802.3ch channel performance

## Topology Parameter Study

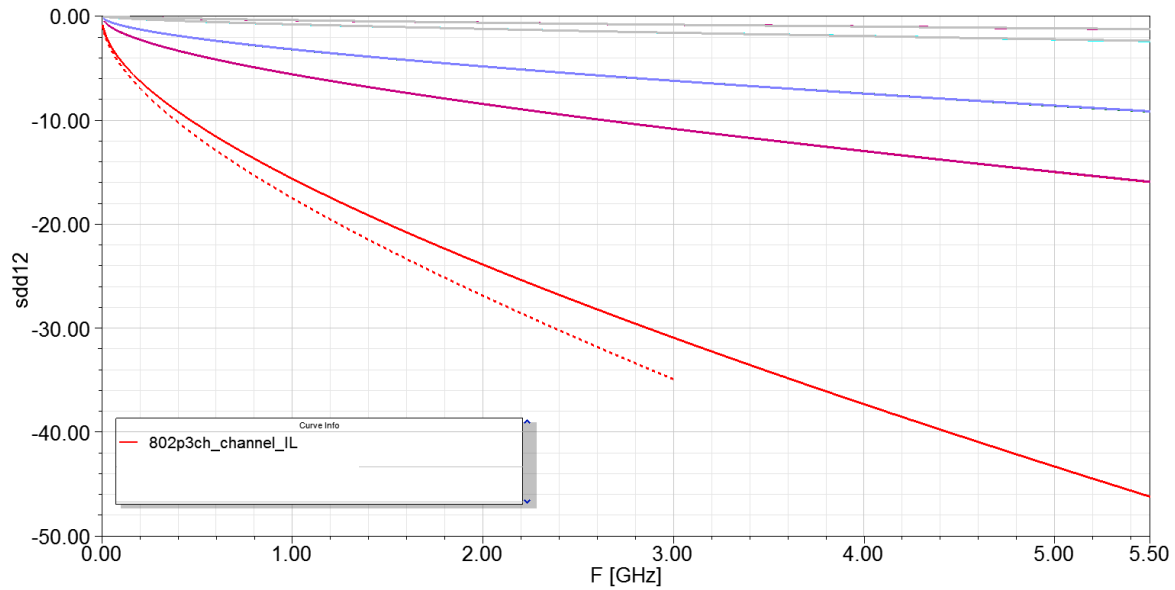
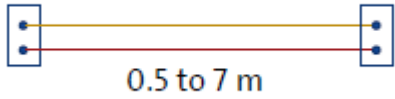
- Channel performance parameter study according to wienckowski\_3ch\_01a\_0118.pdf topology, ideal cable impedance assumed
- PCB- and inline connector models based on simulated s-parameter
- Cable insertion loss has been fitted to match AWG26 cables – model based on double coaxial lines, length altered in steps of 0.5 m
- Additionally cable impedance has altered per segment with  $\pm 3 \Omega$  and  $\pm 5 \Omega$



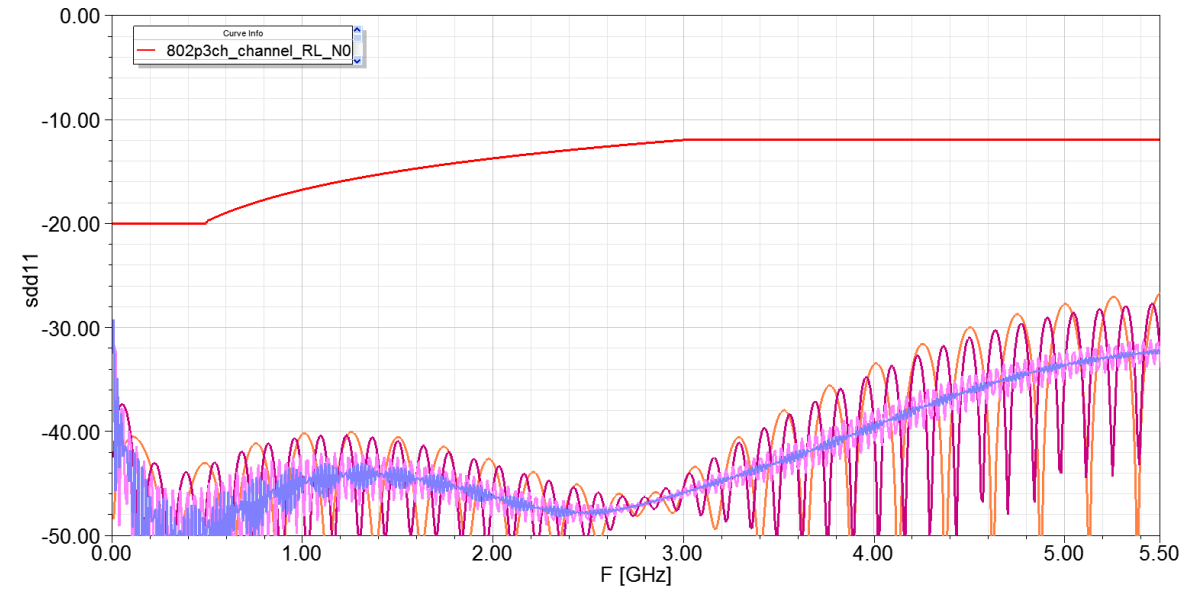
# 802.3ch channel performance

## Topology Parameter Study

- No inline connectors



cable impedance 100  $\Omega$

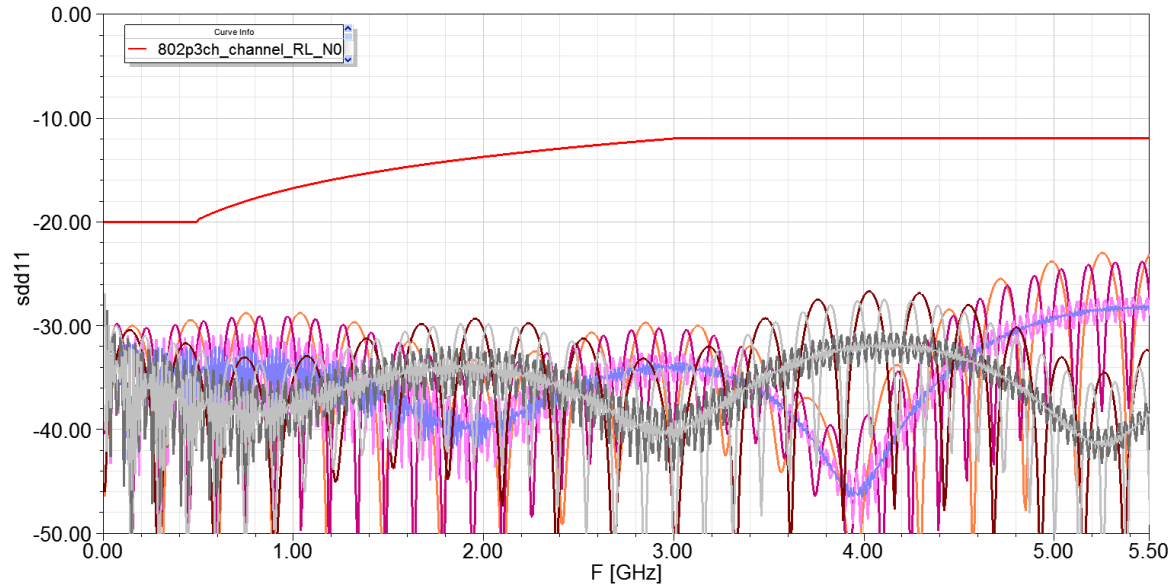
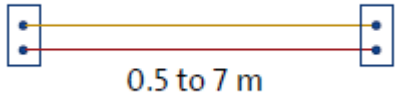


cable impedance 100  $\Omega$

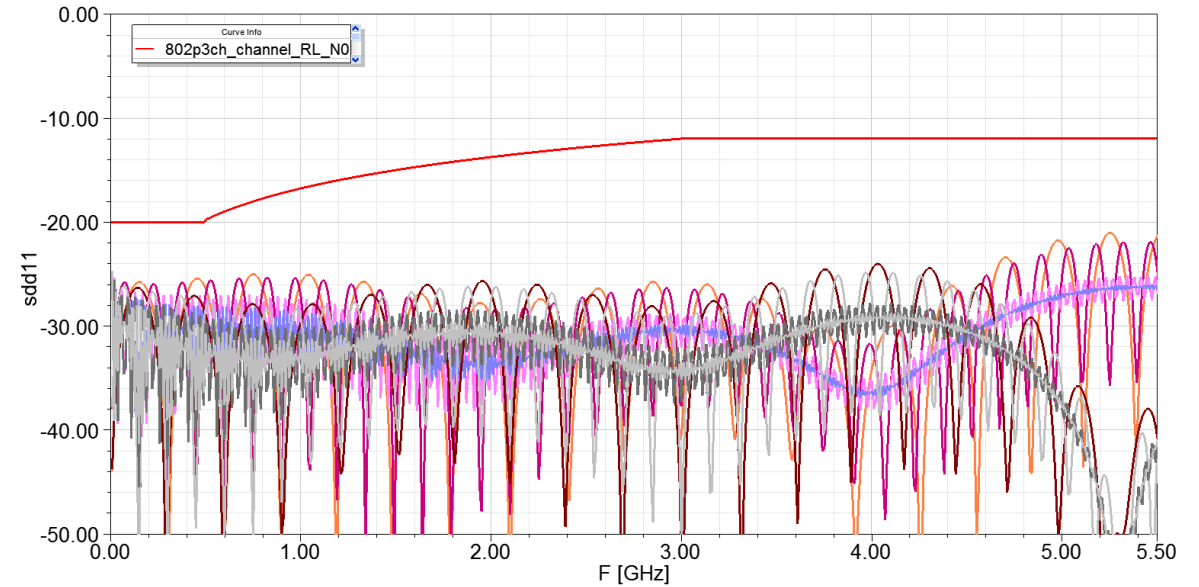
# 802.3ch channel performance

## Topology Parameter Study

- No inline connectors



cable impedance 97  $\Omega$  / 103  $\Omega$

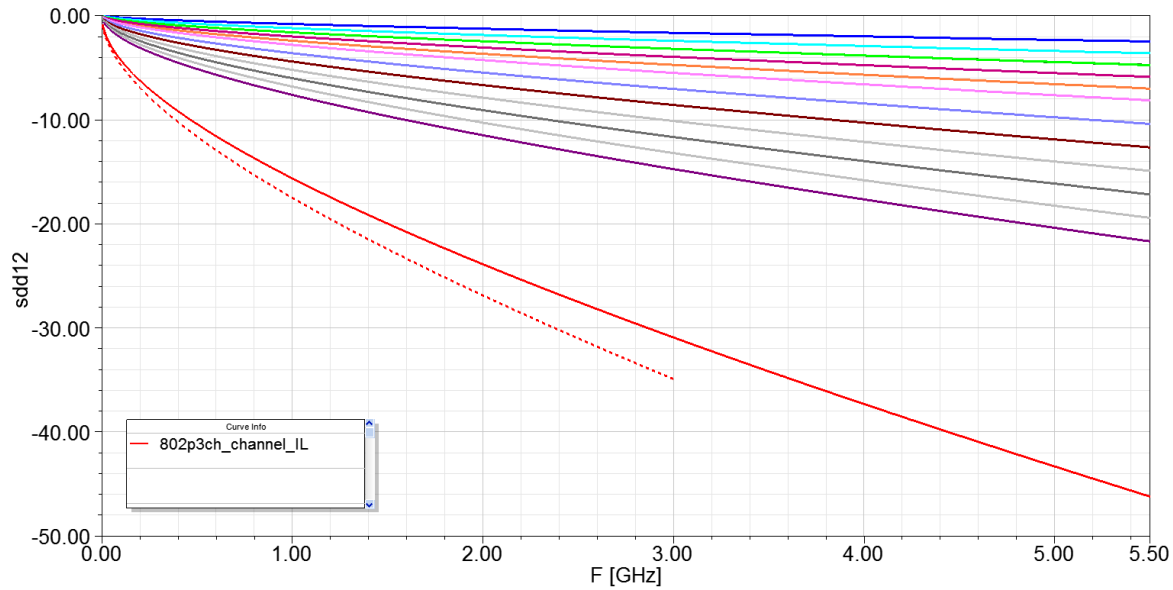


cable impedance 95  $\Omega$  / 105  $\Omega$

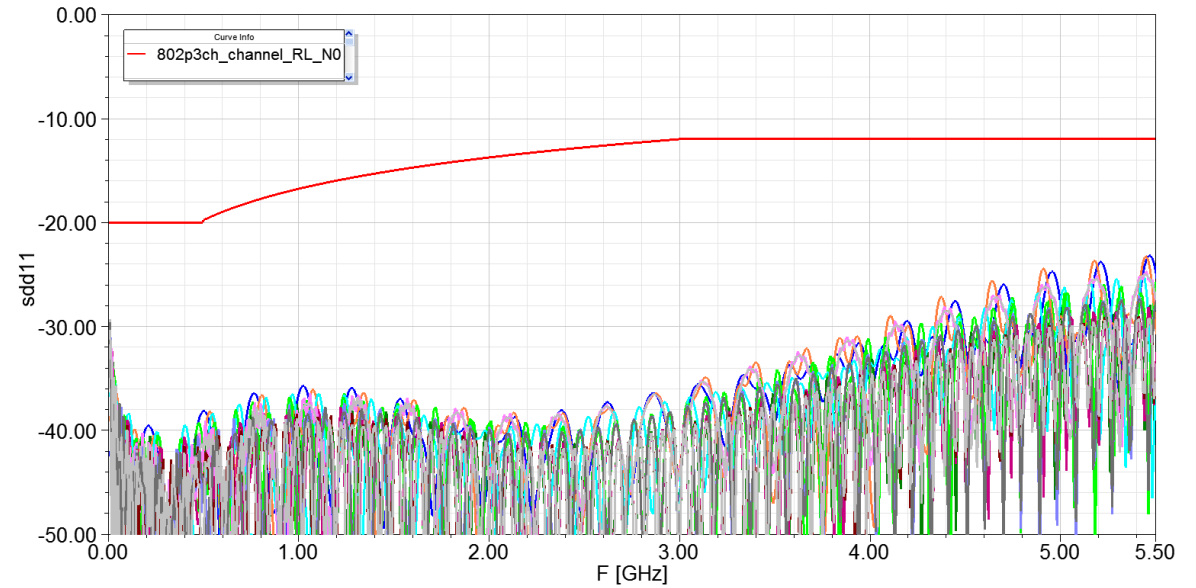
# 802.3ch channel performance

## Topology Parameter Study

- One inline connector



cable impedance 100  $\Omega$

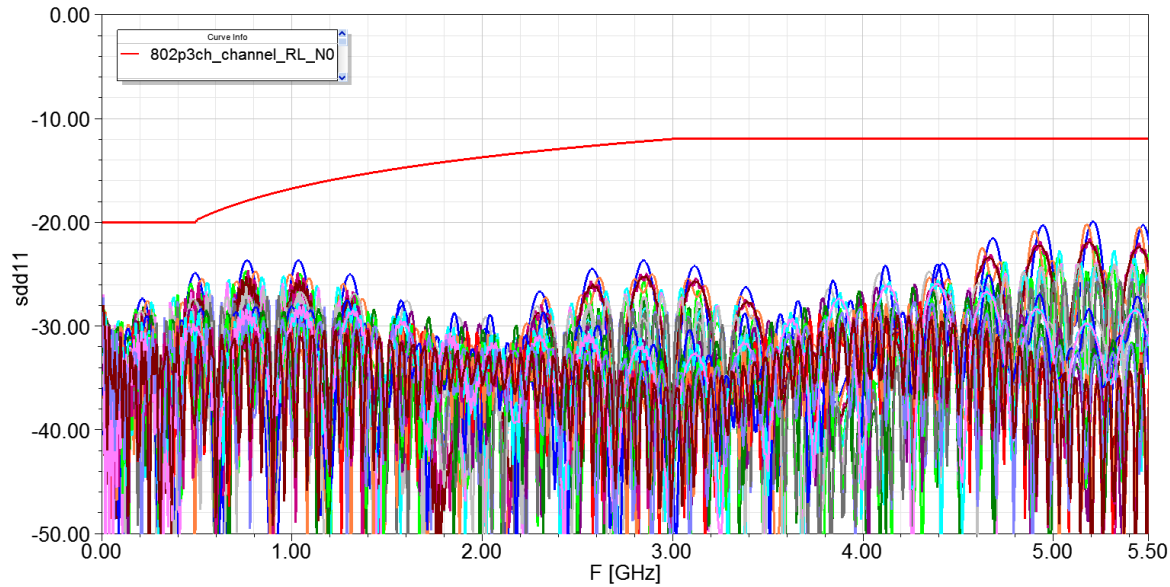


cable impedance 100  $\Omega$

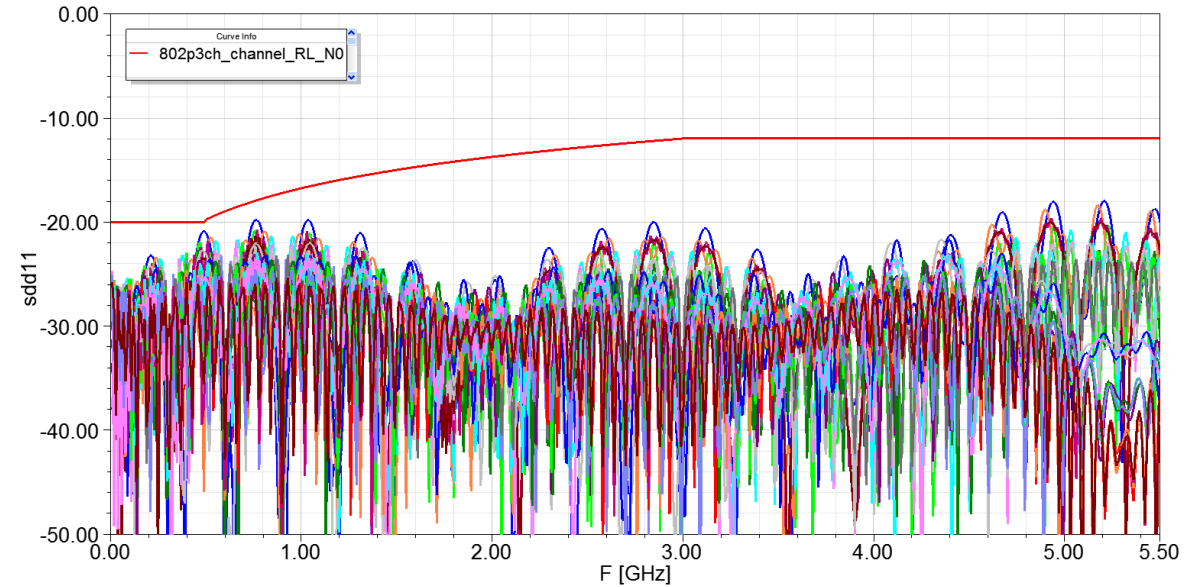
# 802.3ch channel performance

## Topology Parameter Study

- One inline connector



cable impedance 97  $\Omega$  / 103  $\Omega$

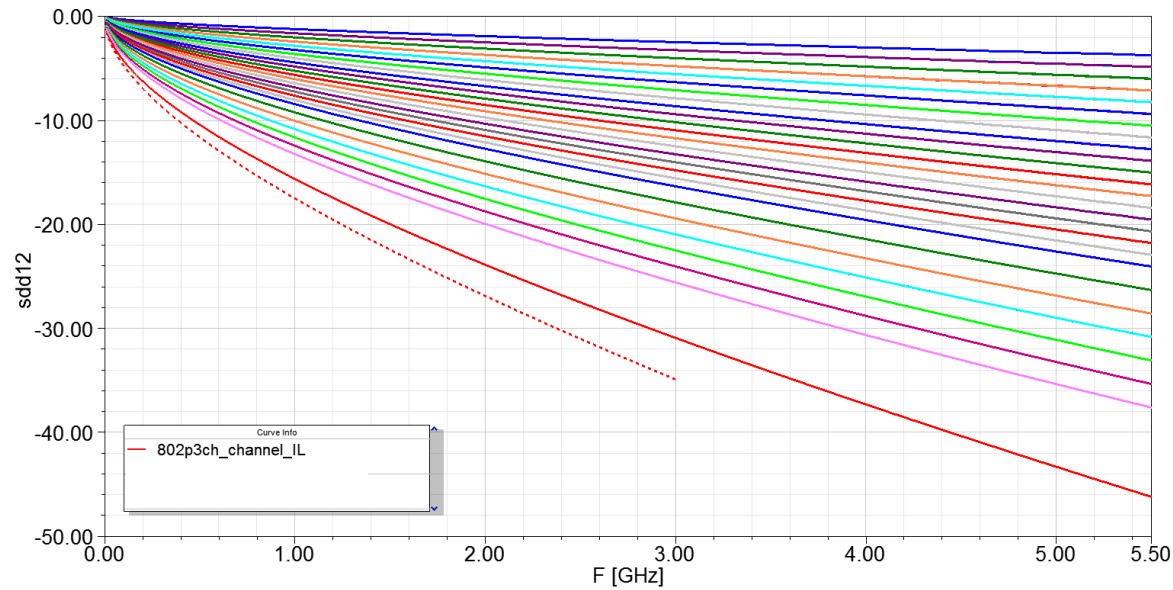


cable impedance 95  $\Omega$  / 105  $\Omega$

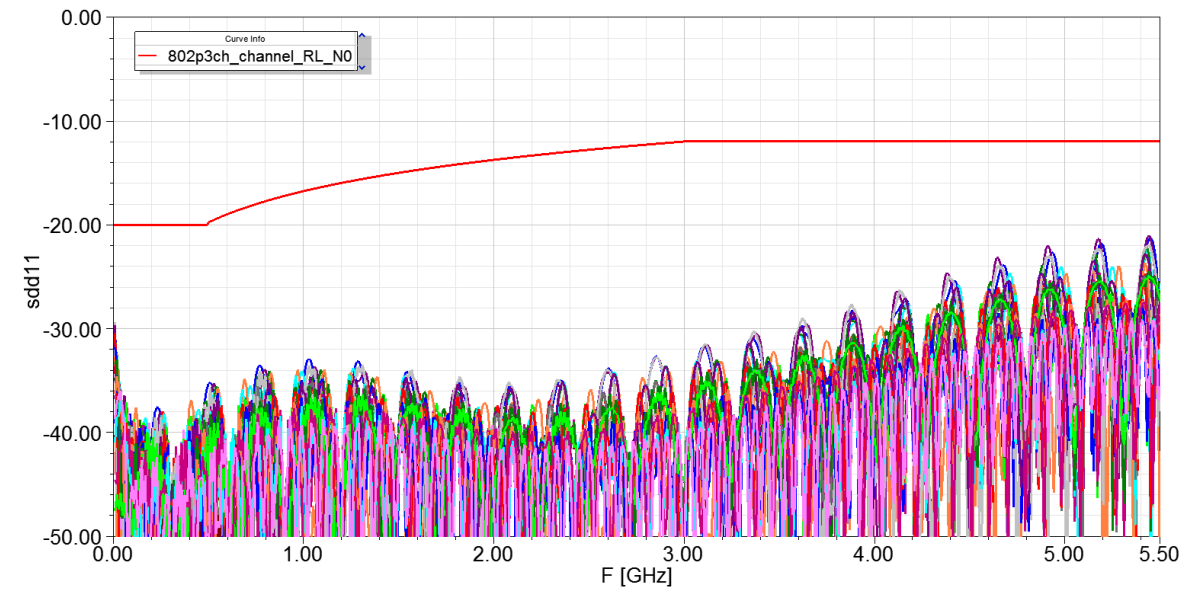
# 802.3ch channel performance

## Topology Parameter Study

- Two inline connectors



cable impedance 100  $\Omega$

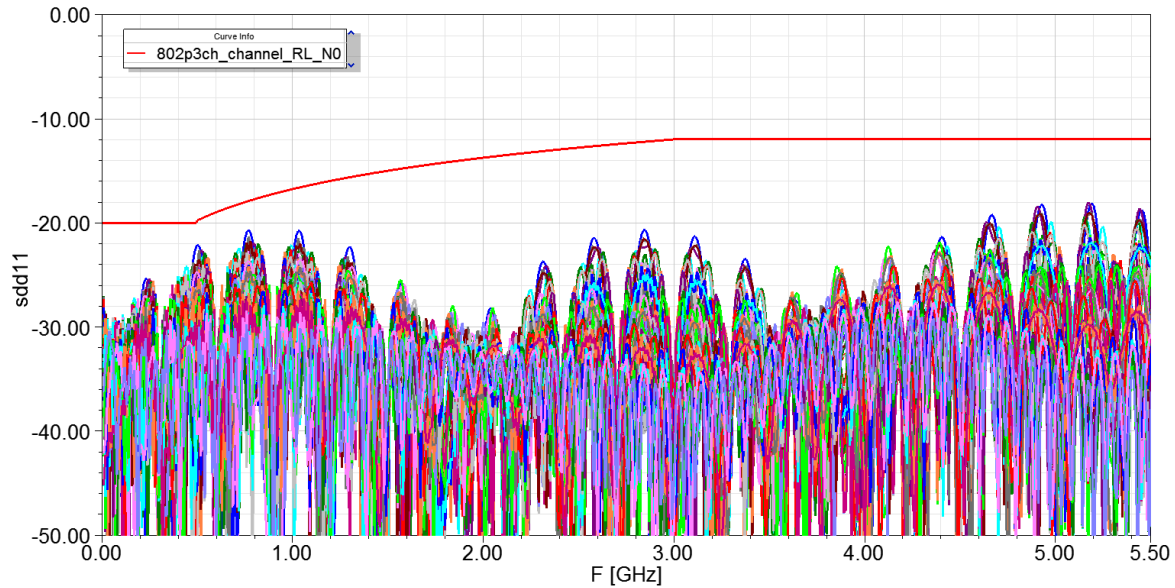
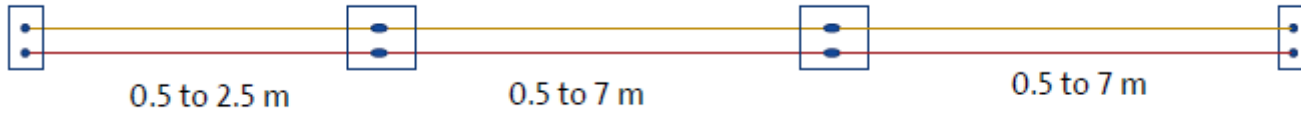


cable impedance 100  $\Omega$

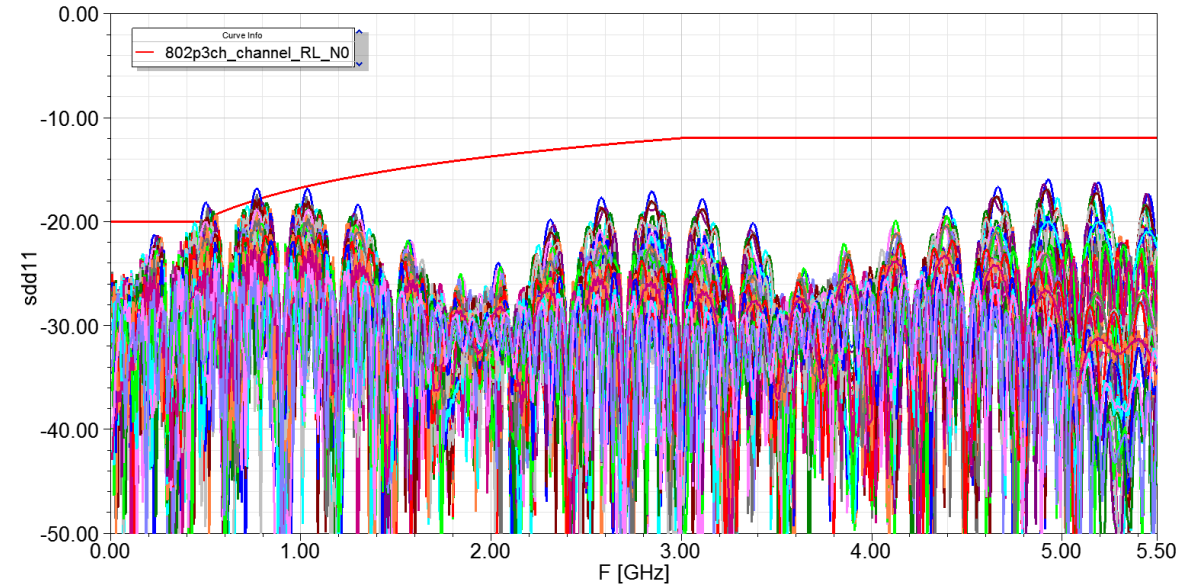
# 802.3ch channel performance

## Topology Parameter Study

- Two inline connectors



cable impedance 97  $\Omega$  / 103  $\Omega$



cable impedance 95  $\Omega$  / 105  $\Omega$



# 802.3ch channel performance

## Topology Parameter Study Summary

- Cable impedance tolerances of  $100 \pm 5 \Omega$  per segment may result in failing the channel return loss requirements
- Typically the same cable type is used within one link, but it is not guaranteed and the cable impedance may vary between production lots
- To meet the channel return loss requirements, implementers should be aware of the cable impedance tolerances and narrow it down as necessary (currently typically  $100 \pm 6 \Omega$  up to  $100 \pm 10 \Omega$ )
- Possible next steps
  - Refine the model with measured connector data
  - Investigate other topologies