



Impedance and Reach COM Analysis

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EVERY CONNECTION COUNTS



Objective: Provide Further Analysis on Reference package impedance and Channel characteristic impedance

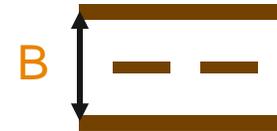
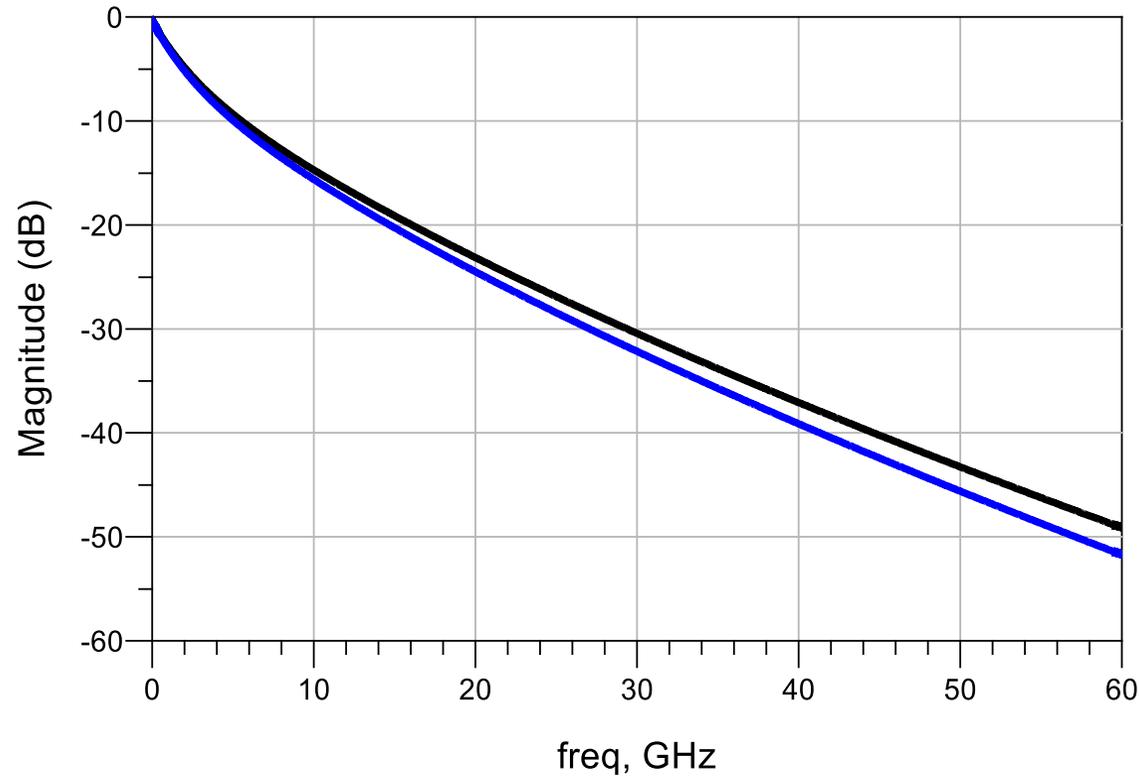
- At the September Interim meeting, there was a discussion about the reference impedance (ran_3ck_02a_0918.pdf) and if it should be modified to better match with package/termination impedance.
- This presentation provides the requested analysis based on a trace and a cable channel. The objective is to understand if a less lossy 100 Ω channel overtake any benefit of better impedance matching between the channel and package/termination by shifting the reference impedance to 90 Ω .

PCB Coupled Stripline, 750mm, ADS Runs

IL 28.02dB @ 26.56GHz (100 Ohm coupled stripline)

IL 29.62dB @ 26.56GHz (90 Ohm coupled stripline)

Differential Insertion Loss



7/7/7 Trace, Meg7, 750mm,
100 Ohm Trace, Ref Imp 100

7/7/7 Trace, Meg7, 750mm,
90 Ohm Trace, Ref Imp 90

SCLIN
CLin2
Subst="SSub1"
W=7.0 mil
S=7.0 mil
L=750 mm

SSub

SSUB
SSub1
Er=3.2
Mur=1
B=14 mil
T=18 um
Cond=5.8e7
TanD=.002
Rough=1.4 um
Bbase=
Dpeaks=

SCLIN
CLin2
Subst="SSub1"
W=7.0 mil
S=7.0 mil
L=750 mm

SSub

SSUB
SSub1
Er=3.2
Mur=1
B=17 mil
T=18 um
Cond=5.8e7
TanD=.002
Rough=1.4 um
Bbase=
Dpeaks=

B was modified to
adjust the impedance

All Devices Plotted using their respective reference Impedances

COM 2.51 (config_com_ieee8023_93a=100GEL-KR_DFE_100118)

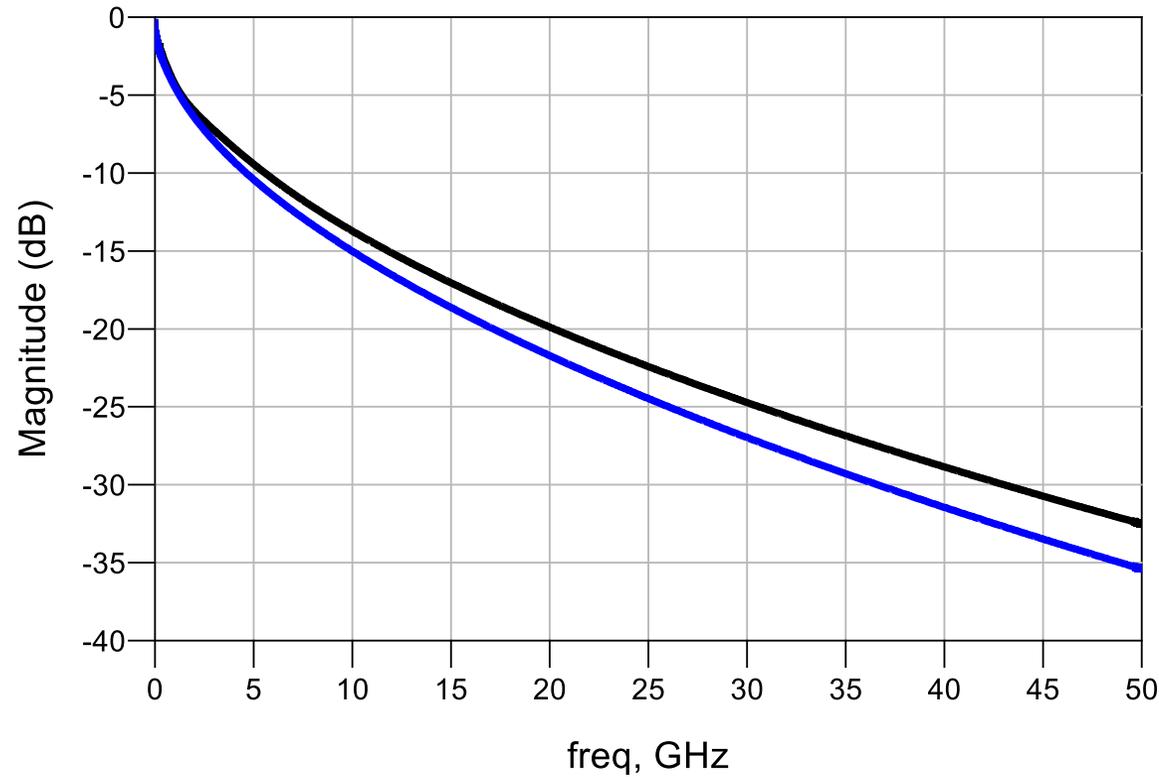
DUT	COM (case 1= 12mm)	COM (case 2= 30mm)
Coupled Stripline 100 Ohm (package ref impedance 90)	4.39	3.12
Coupled Stripline 90 Ohm (package ref impedance 90)	3.66	2.31
Coupled Stripline 100 Ohm (package ref impedance 92.5)	4.36	3.11
Coupled Stripline 90 Ohm (package ref impedance 92.5)	3.60	2.30
Coupled Stripline 100 Ohm (package ref impedance 95)	4.33	3.07
Coupled Stripline 90 Ohm (package ref impedance 95)	3.60	2.29

Cable, HFSS Runs

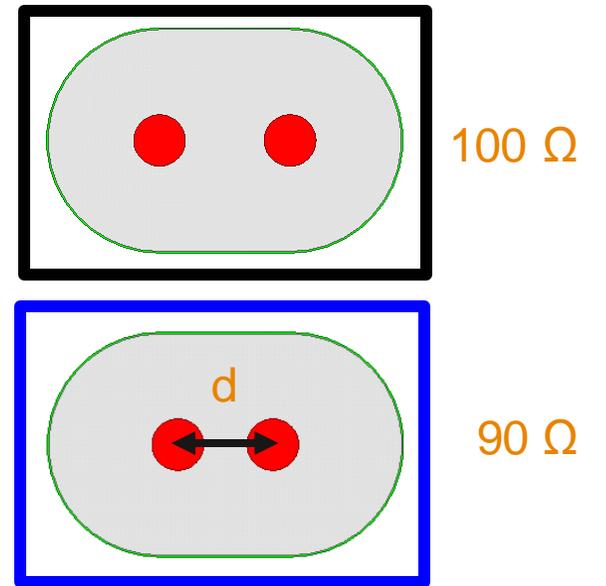
IL 23.16dB @ 26.56GHz (100 Ohm cable)

IL 25.27dB @ 26.56GHz (90 Ohm cable)

Differential Insertion Loss



All Devices Plotted using their respective reference Impedances



d was modified to adjust the impedance

COM 2.51 (config_com_ieee8023_93a=100GEL-KR_DFE_100118)

DUT	COM (case 1= 12mm)	COM (case 2= 30mm)
Cable 100 Ohm (package ref impedance 90)	7.82	6.78
Cable 90 Ohm (package ref impedance 90)	7.29	5.84
Cable 100 Ohm (package ref impedance 92.5)	7.76	6.78
Cable 90 Ohm (package ref impedance 92.5)	7.29	5.88
Cable 100 Ohm (package ref impedance 95)	7.82	6.76
Cable 90 Ohm (package ref impedance 95)	7.25	5.90

Summary

- Improved impedance match from 90 Ω reference is overcome by higher losses, 100 Ω reference impedance provides the best performance.
 - 100 Ω reference impedance provides better COM result by about ~0.5-0.8dB (Case1=12mm and Case2=30mm) and increases channel reach