

```
; Top Design:
"PA_DESIGN_CGHA40010F_lib:cell_2:Input_Output_Matching_ZS_ZL_DataSheet
_Vaues_BigBos_Correct_Sub_Circuit"
; Netlisted using Hierarchy Policy: "Standard"
```

```
Options ResourceUsage=yes UseNutmegFormat=no EnableOptim=no
TopDesignName="PA_DESIGN_CGHA40010F_lib:cell_2:Input_Output_Matching_Z
S_ZL_DataSheet_Vaues_BigBos_Correct_Sub_Circuit"
DcopOutputNodeVoltages=yes DcopOutputPinCurrents=yes
DcopOutputAllSweepPoints=no DcopOutputDcopType=0
; Library Name: PA_DESIGN_CGHA40010F_lib
; Cell Name: Input_Matching_1
; View Name: schematic
define Input_Matching_1 ( P1 P2 P3 )
;parameters
MSTEP:Step2 N__6 N__10 Subst="MSub1" W1=0.835 mm W2=1.5 mm
MLIN2:TL3 N__10 N__7 Subst="MSub1" W=1.5 mm L=0.5 mm Mod=1
MGAP:Gap1 N__7 N__0 Subst="MSub1" W=25.0 mil S=10.0 mil
MSTEP:Step1 N__5 N__3 Subst="MSub1" W1=1.62 mm W2=0.835 mm
MLIN2:TL2 N__3 N__6 Subst="MSub1" W=835.836 um L=9.50338 mm Mod=1
model MSub1 MSUB H=0.635 mm Er=3.66 Mur=1 Cond=5.8e7 Hu=3.93701e+034
mil T=70 um TanD=0.004 Rough=0 mil DielectricLossModel=1
FreqForEpsrTanD=1.0 GHz LowFreqForTanD=1.0 kHz HighFreqForTanD=1.0 THz
RoughnessModel=2
MLIN2:TL1 P3 N__5 Subst="MSub1" W=1.62 mm L=2 mm Mod=1
MLIN2:TL4 N__0 N__1 Subst="MSub1" W=1.5 mm L=0.5 mm Mod=1
C:C1 N__10 N__1 C=1.614461 pF
MSTEP:Step3 N__1 N__9 Subst="MSub1" W1=1.5 mm W2=1.96 mm
MLIN2:TL5 N__9 N__11 Subst="MSub1" W=1.96915 mm L=1.31022 mm Mod=1
MLIN2:TL7 N__13 N__14 Subst="MSub1" W=3.09563 mm L=495.801 um Mod=1
MTEE_ADS:Tee2 N__11 N__13 N__12 Subst="MSub1" W1=1.96 mm W2=3.09 mm
W3=0.928 mm
MLOC2:TL6 N__12 Subst="MSub1" W=928.267 um L=1.91997 mm Mod=1
MTEE_ADS:Tee3 N__17 N__14 N__16 Subst="MSub1" W1=3.09 mm W2=4.25 mm
W3=1.99 mm
MLOC2:TL8 N__16 Subst="MSub1" W=1.99232 mm L=2.48877 mm Mod=1
MLIN2:TL9 N__17 N__8 Subst="MSub1" W=4.25709 mm L=500.09 um Mod=1
MTEE_ADS:Tee4 N__8 N__23 N__18 Subst="MSub1" W1=4.25 mm W2=1.62 mm
W3=0.37 mm
MLIN2:TL10 N__18 P2 Subst="MSub1" W=0.37 mm L=19.7 mm Mod=1
CAPQ:C2 0 P2 C=10 pF Q=500 F=100.0 MHz Mode=1
CAPQ:C3 0 P2 C=39 pF Q=500 F=100.0 MHz Mode=1
MLIN2:TL11 N__23 P1 Subst="MSub1" W=1.62 mm L=1.03 mm Mod=1
end Input_Matching_1
```

```
; Library Name: PA_DESIGN_CGHA40010F_lib
; Cell Name: Output_Matching
; View Name: schematic
define Output_Matching ( P1 P2 P3 )
;parameters
MLIN2:TL3 N__15 N__7 Subst="MSub1" W=1.5 mm L=0.5 mm Mod=1
MGAP:Gap1 N__7 N__0 Subst="MSub1" W=1.5 mm S=0.5 mm
```

```

MSTEP:Step1 N__29 N__3 Subst="MSub1" W1=1.5 mm W2=1.55 mm
MLIN2:TL2 N__3 N__31 Subst="MSub1" W=1.55139 mm L=6.06362 mm Mod=1
model MSub1 MSUB H=0.635 mm Er=3.66 Mur=1 Cond=5.8e7 Hu=3.93701e+034
mil T=70 um TanD=0.004 Rough=0 mm DielectricLossModel=1
FreqForEpsrTanD=1.0 GHz LowFreqForTanD=1.0 kHz HighFreqForTanD=1.0 THz
RoughnessModel=2
MLIN2:TL1 P3 N__25 Subst="MSub1" W=4.83822 mm L=3.647 mm Mod=1
MLIN2:TL4 N__0 N__27 Subst="MSub1" W=1.5 mm L=0.5 mm Mod=1
CAPQ:C4 N__15 N__27 C=79.6544 pF Q=500 F=100.0 MHz Mode=1
MLIN2:TL5 N__9 P1 Subst="MSub1" W=1.32 mm L=4.21486 mm Mod=1
MTEE_ADS:Tee2 N__31 N__9 N__12 Subst="MSub1" W1=1.55 mm W2=1.32 mm
W3=3.07 mm
MLOC2:TL6 N__12 Subst="MSub1" W=3.07899 mm L=6.36877 mm Mod=1
MLIN2:TL10 N__18 P2 Subst="MSub1" W=1.32 mm L=18.28. mm Mod=1
CAPQ:C2 0 P2 C=10 pF Q=500.0 F=2400 MHz Mode=1
CAPQ:C3 0 P2 C=39 pF Q=500.0 F=2400 MHz Mode=1
MTEE_ADS:Tee5 N__25 N__15 N__18 Subst="MSub1" W1=4.8 mm W2=1.5 mm
W3=1.32 mm
MTEE_ADS:Tee6 N__24 N__27 N__1 Subst="MSub1" W1=1.5 mm W2=1.5 mm
W3=0..89 mm
MLIN2:TL14 N__30 N__29 Subst="MSub1" W=1.5 mm L=0.5 mm Mod=1
MLSC2:TL13 N__1 Subst="MSub1" W=890.285 mm L=14.3626 mm Mod=1
MLIN2:TL15 N__24 N__28 Subst="MSub1" W=1.5 mm L=0.5 mm Mod=1
MGAP:Gap2 N__28 N__30 Subst="MSub1" W=1.5 mm S=0.5 mm
CAPQ:C5 N__24 N__29 C=17.1417 pF Q=500 F=100.0 MHz Mode=1
end Output_Matching

```

```

Short:Is_low N__10 N__9 Mode=0 SaveCurrent=yes
V_Source:SRC2 N__10 0 Type="V_DC" Vdc=Vlow SaveCurrent=1
MLIN2:TL1 N__15 Vin Subst="MSub1" W=1.32 mm L=2 mm Mod=1
Port:PORT1 N__3 0 Num=1 Z=50 Ohm P[1]=polar(dbmtow(RF_Power),0)
Freq[1]=RFreq GHz Noise=yes Pac=polar(dbmtow(0),0)
LimitPhaseNoiseToCarrier=no
model MSub1 MSUB Er=3.66 Mur=1 Cond=5.8E7 Hu=3.93701e+034 mil T=70 um
TanD=0.004 Rough=0 mm DielectricLossModel=1 FreqForEpsrTanD=1.0 GHz
LowFreqForTanD=1.0 kHz HighFreqForTanD=1.0 THz RoughnessModel=2
R:R2 N__4 N__15 R=8.90531 Noise=yes
#uselib "ckt" , "P_Probe"
P_Probe:Power_Load N__13 Vout
#uselib "CGH40010F_package" ,
"Packaged_lib_CGH40010F_package_schematic"
"Packaged_lib_CGH40010F_package_schematic":X5 Vin N__16 0 t=25 rth=8
Short:DC_Block1 N__12 N__17 Mode=1
Input_Matching_1:X10 N__4 N__14 N__17
Port:Term2 Vout 0 Num=2 Z=50 Ohm Noise=yes
Short:DC_Feed1 N__9 N__14 Mode=-1
Short:Is_high N__18 N__7 Mode=0 SaveCurrent=yes
V_Source:SRC1 N__7 0 Type="V_DC" Vdc=Vhigh SaveCurrent=1

```

```

RFreq=2.4
Vhigh=28 V
Vlow=-2.71 V

```

```

RF_Power=28.7
X_dB_target=3
S_Param:SP1 CalcS=yes CalcY=no CalcZ=no GroupDelayAperture=1e-4
FreqConversion=no FreqConversionPort=1 StatusLevel=2 CalcNoise=no
SortNoise=0 BandwidthForNoise=1.0 Hz DevOpPtLevel=0 \
SweepVar="freq" SweepPlan="SP1_stim" OutputPlan="SP1_Output"

SweepPlan: SP1_stim Start=0.1 GHz Stop=5 GHz Step=0.01 GHz

OutputPlan:SP1_Output \
    Type="Output" \
    UseEquationNestLevel=yes \
    EquationNestLevel=2 \
    UseSavedEquationNestLevel=yes \
    SavedEquationNestLevel=2

#load "python","LinearCollapse"
Component Module="LinearCollapse" Type="ModelExtractor"
NetworkRepresentation=2
aele
Pdel_W=0.5*real(Vload[1]*conj(ILoad.i[1]));Pdel_dBm=10*log(Pdel_W)+30;
Pin_W=0.5*real(Vinput[1]*conj(I_input.i[1]));Pdc=real(Vs_low[0]*Is_low
.i[0]+Vs_high[0]*Is_high.i[0]);PAE=100*(Pdel_W-
Pin_W)/Pdc;Deff=100*Pdel_W/Pdc;LS_Gain_dB=Pdel_dBm-Pavs_dBm;

ZS=3.19-j*4.76
ZL=19+j*9.2
HB:HB1 MaxOrder=4 Freq[1]=RFreq GHz Order[1]=10 StatusLevel=2
HBSS_WSP=0 OutputPlan="HB1_Output"

OutputPlan:HB1_Output \
    Type="Output" \
    UseNodeNestLevel=yes \
    NodeNestLevel=2 \
    UseEquationNestLevel=yes \
    EquationNestLevel=2 \
    UseSavedEquationNestLevel=yes \
    SavedEquationNestLevel=2 \
    UseDeviceCurrentNestLevel=no \
    DeviceCurrentNestLevel=0 \
    DeviceCurrentDeviceType="All" \
    DeviceCurrentSymSyntax=yes \
    UseCurrentNestLevel=yes \
    CurrentNestLevel=999 \
    UseDeviceVoltageNestLevel=no \
    DeviceVoltageNestLevel=0 \
    DeviceVoltageDeviceType="All"

Tran:HB1_tran HB_Sol=1 SteadyState=1 StatusLevel=3 \
Freq[1]=RFreq GHz Order[1]=10

```

```
Component:tahb_HB1 Module="ATAHB" Type="ModelExtractor" \  
Tran_Analysis="HB1_tran" HB_Analysis="HB1"
```

```
#uselib "ckt" , "P_Probe"
```

```
P_Probe:Power_Source N__3 N__12
```

```
MLIN2:TL2 N__16 N__0 Subst="MSub1" W=1.32 mm L=1 mm Mod=1
```

```
aele StabFact1=stab_fact(S);
```

```
Output_Matching:X9 N__13 N__5 N__0
```

```
Short:DC_Feed2 N__18 N__5 Mode=-1
```

```
Optim:"Optim1" OptimType="hpVMO" ErrorForm="L2" MaxIters=2500 P=2  
DesiredError=0.0 StatusLevel=4 FinalAnalysis="None" NormalizeGoals=yes  
SetBestValues=yes SaveSolns=yes SaveGoals=yes SaveOptimVars=no  
UpdateDataset=yes SaveNominal=no SaveAllIterations=no  
UseAllOptVars=yes UseAllGoals=yes SaveCurrentEF=no  
InitialTempControlMode=0 SANumTrialsPerIter=10 NumShootsPerIter=20  
SATempControlAlpha=0.8 EnableCockpit=yes NormalizeError=yes  
SaveAllTrials=no UseAdvTermCriteria=no CostRelativeTol=1.0e-8  
LimitOfContSmallImprovement=5
```

```
OptimGoal:OptimGoal5 Expr="dB(S11)" SimInstanceName="SP1" Weight=1 \  
SpecLimitLine[1]="OptimGoal5_limit1"
```

```
SpecLimitLine:"OptimGoal5_limit1" Type="LessThan" Max=18 Weight=1.0
```

```
OptimGoal:OptimGoal6 Expr="LS_Gain_dB" SimInstanceName="HB1" Weight=1
```

```
\
```

```
SpecLimitLine[1]="OptimGoal6_limit1"
```

```
SpecLimitLine:"OptimGoal6_limit1" Type="GreaterThan" Min=12 Weight=1.0
```

```
OptimGoal:OptimGoal1 Expr="Pdel_dBm" SimInstanceName="HB1" Weight=1 \  
SpecLimitLine[1]="OptimGoal1_limit1"
```

```
SpecLimitLine:"OptimGoal1_limit1" Type="GreaterThan" Min=40.5
```

```
Weight=1.0
```

```
OptimGoal:OptimGoal4 Expr="dB(S22)" SimInstanceName="SP1" Weight=1 \  
SpecLimitLine[1]="OptimGoal4_limit1"
```

```
SpecLimitLine:"OptimGoal4_limit1" Type="LessThan" Max=20 Weight=1.0
```