

Build #4  
DOE7\_1 to DOE7\_5  
T9507B\_2 (2.4 mm – 6x400  $\mu\text{m}$ )

draft

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10-05-2022  
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- restricted -

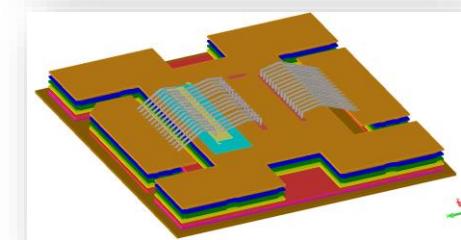
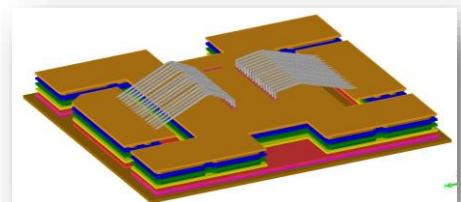
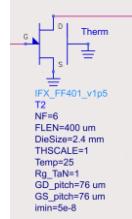
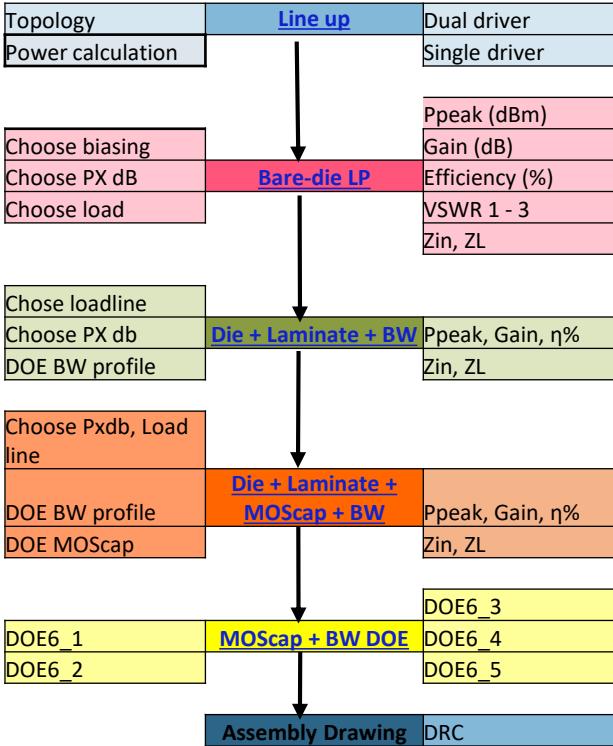
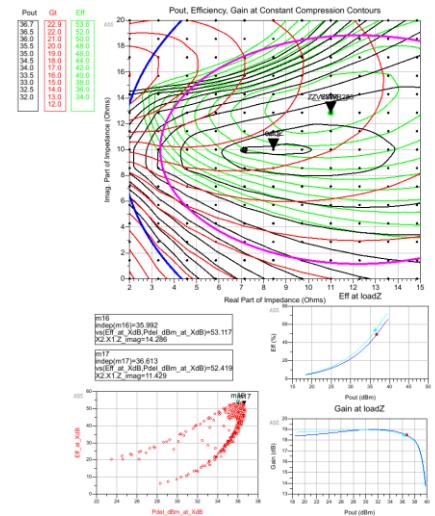


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# Design approach



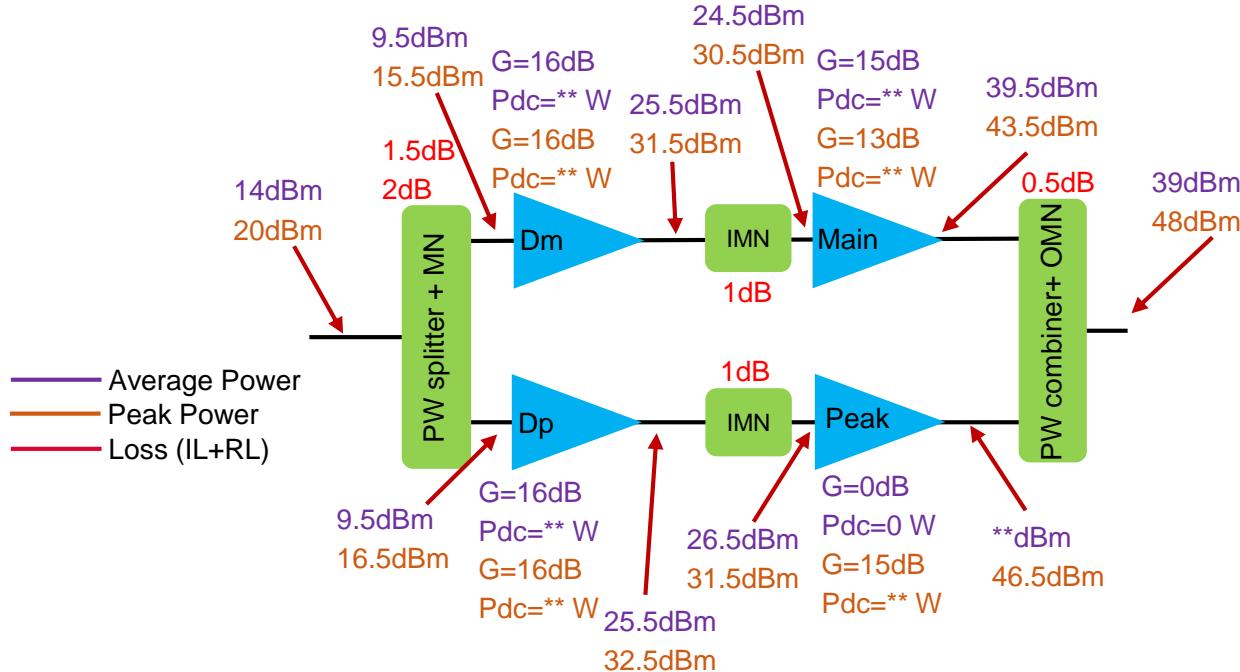
# Build tracking: starting point

## Minipack build tracking

Assembly build order	Assembly build order	Variant (DOE)	Laser Marking for Samples	RF GaN device geometry	RF GaN device name	RF GaN device wafer	Quantity of available RF GaN	Required quantity of RF GaN	Required availability date of R
4	4	DOE7_1		2.4 (6*400um)	T9507B_2	T9507B	~3000	30	04.03.2022
4	4	DOE7_2		2.4 (6*400um)	T9507B_2	T9507B	~3000	30	04.03.2022
4	4	DOE7_3		2.4 (6*400um)	T9507B_2	T9507B	~3000	30	04.03.2022
4	4	DOE7_4		2.4 (6*400um)	T9507B_2	T9507B	~3000	30	04.03.2022
4	4	DOE7_5		2.4 (6*400um)	T9507B_2	T9507B	~3000	30	04.03.2022

## RFP\_tech\_product catalog -PL55 (Active GaN die)

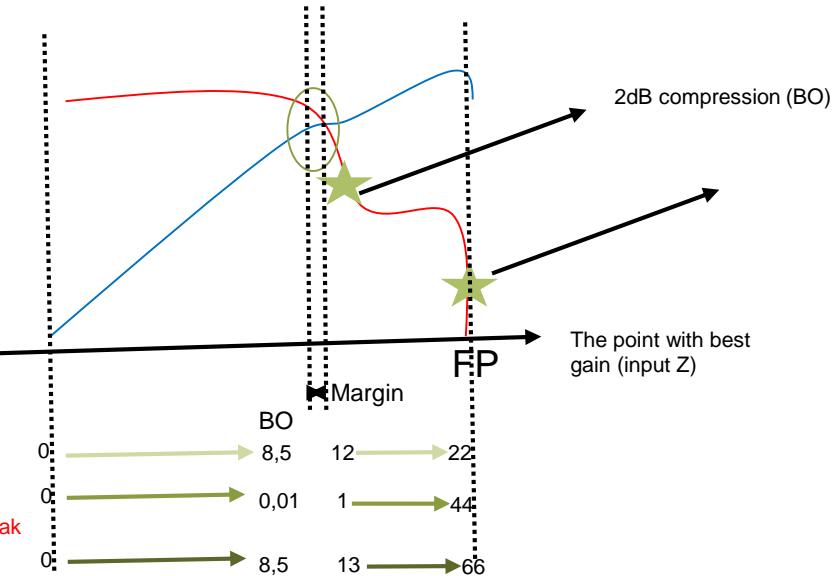
sequence	Tech	basetype	Chip label	basetype_chip	short description (periphery_finger_length_pitch)	reticle kind	D9 released basetype	Die X (um)	Die Y (um)	die area	aspect ratio	Gate Periphery (mm)	# Gate tabs	Gate Tab Distance (um)	Gate Width / Finger Length (um)	Gate-source pitch [um]	Gate-drain pitch [um]	gate fingers	# Gate Pad Tubs	Gate Pad Size (PG opening in Y over pad)
4	RFGaN-C1	T9507A	T9507A_2	T9507A_T9507A_2	2,4_400_80,1	adjacent die	-	804	816	0,66	0,99	2,4	5	80	400	79,9	80,1	6	1	80
11	RFGaN-C1	T9507B	T9507B_2	T9507B_T9507B_2	2,4_400_80,1	adjacent die	-	804	816	0,66	0,99	2,4	5	80	400	79,9	80,1	6	1	80
206	High Power	R9507A	T9507B_2	R9507A_T9507B_2	2,4_400_80,1	shared	-	844	818	0,69	1,03	2,4	5	80	400	79,9	80,1	6	1	80



# Power calculation: Asymmetric Doherty

Specification		P3dB (MHz)	P3dB (W)	PAR				
Project	Frequency-Range [MHz]	47,4	54,95	8,4				
PAM 2.0+	3400 - 3800							
	Pavg (dBm)	Pavg (W)						
	39	7,94						
Doherty Topology	Remark	Ratio	Main (W)	Peak (W)				
2-way asymmetric	To maximize efficiency	2	18,32	36,64				
Estimation including loss								
	Required power (W)	Required power (dBm)	Loss (dBm)	Total required power (dBm)				
Main	18,32	42,63	0,8	43,43				
				22,02				
Peak	36,64	45,64	0,8	46,44				
				44,05				
	Total output power (dBm)	PAR	Power @ MXE (dBm)	Margin (dB)	Power @ MXE (dBm)	Power @ MXE (W)	MXP (W)	MXP (dBm)
Main	48,2	8,4	39,8	1,00	40,80	12,02	22,02	43,43
Peak			Peak_start_ideal		Peak_start	0,01	44,05	46,44

Required power from peak



- › Maximize Gain
  - › Main section gain as high as possible while maintaining Power @ MXE
  - › Peak section gain as high as possible while maintaining MXP

# Power calculation: Hybrid Symmetric Doherty

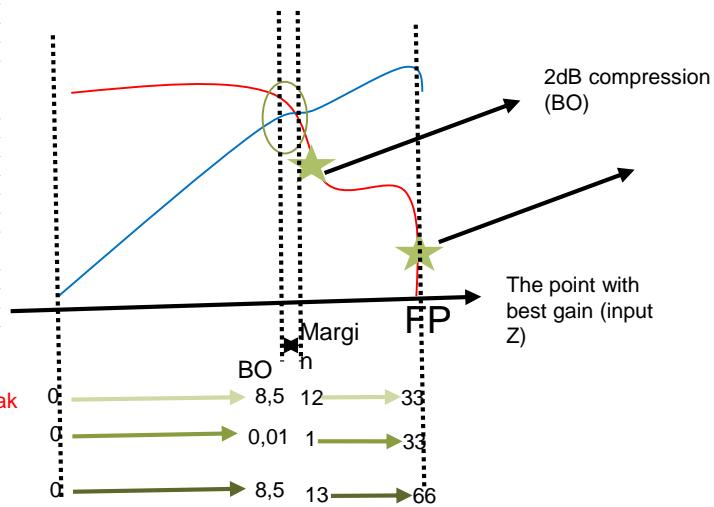
Doherty Topology	Remark	Ratio	Main (W)	Peak (W)
Symmetric	Maximize BW	1	27,48	27,48

## Estimation including loss

	Required power (W)	Required power (dBm)	Loss (dBm)	Total required power (dBm)	Total required power (W)	Ratio	Total power (W)	Total power (dBm)
Main	27,48	44,39	0,8	45,19	33,03		66,07	48,2
Peak	27,48	44,39	0,8	45,19	33,03			

	Total output power	PAR	Power @ MXE (dBm)	Margin (dB)	Power @ MXE (dBm)	Power @ MXE (W)	MXP (W)	MXP (dBm)
Main	48,2	8,4	39,8	1,00	40,80	12,02	33,03	45,19
Peak			Peak_start_ideal		Peak_start	0,01	33,03	45,19

Required power from peak



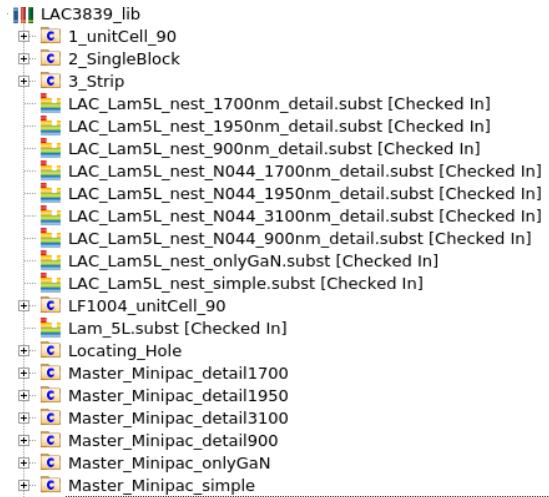
## Maximize Gain

- › Main section gain as high as possible while maintaining Power @ MXE
- › Peak section gain as high as possible while maintaining MXP



# Design on laminate DOE6

## › Laminate library:LAC3839\_lib



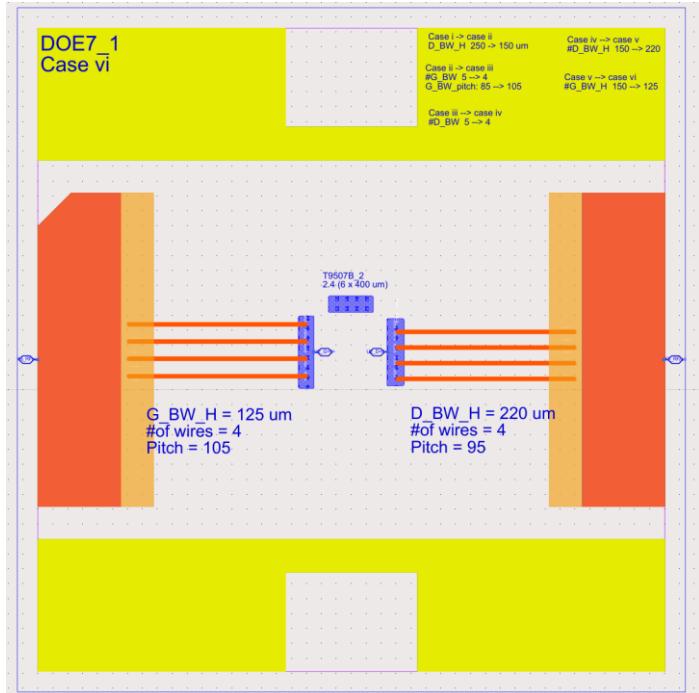
	GaN	MOSCap
Design	Die_GaN_v0_lib	IC_LD8C_lib
Assembly drawing		Central_v0_lib



# DOE6\_1: Laminate, Bond Wire selection

Simulation case/BW profile	G_BW_H (μm)	#G_BW	G_BW_pitch (μm)	G_BW_L (μm)	D_BW_H (μm)	#D_BW	D_BW_pitch (μm)	D_BW_L (μm)
Case i	150	5	85	1070	250	5	75	1070
Case ii	150	5	85	1070	150	5	75	1070
Case iii	150	4	105	1070	150	5	75	1070
Case iv	150	4	105	1070	150	4	95	1070
Case v	150	4	105	1070	220	4	95	1070
Case vi	125	4	105	1070	220	4	95	1070

P_0.5dB	Max. performance @ P1.5dB				@ MXE			
	Simulation case/BW_profile	MXP (dBm)	MXG (dB)	MXE (%)	Zin_Re (Ω)	Zin_L (Ω)	Pout (dBm)	Eff. (%)
Bare die		37,90	24,4	50,60	1,3 - j 9,7	24,4 + j 24	36,65	50,7
Case i		36,3	25,8	49	2,3 + j 1,9	13 + j 16,1	35,62	49,10
Case ii		36,40	23,0	50,00	2,1 + j 0,6	12,1 + j 16,1	35,74	50,00
Case iii		36,20	23,5	49,00	2,1 + j 0,9	12,1 + j 16,1	35,65	49,30
Case iv		36,20	23,6	49,40	2,1 + j 1,0	12,7 + j 17,3	35,52	49,40
Case v		36,20	24,6	49,00	2,5 + j 2,0	12,7 + j 17,3	35,40	49,10
DOE7_1 Case vi		36,20	24,6	49,00	2,5 + j 2,1	12,1 + j 17,3	36,39	49,00



# Build #3 DOE6 simulation variants

- › DOE variants definition approach

- › .....

- › .....



# DOE7\_simulated performance: MOScap (4) X (4) BW profile (with simple EM model)

DOE	P_0.5dB	Moscap		Max. performance @ P0.5 dB			Performance @ MXE					IRL (dB)	
	Simuation case_BW_profile	Name	Value (pF)	MXP (dBm)	MXG (dB)	MXE (%)	Zin_Re ( $\Omega$ )	Zin_imag ( $\Omega$ )	Z_L ( $\Omega$ )	Pout (dBm)	Eff. (%)		
	Case 0	N9501A_Index_1	1,94	36,70	24,30	51,10	1,50	3,30	11,3 + j 14,3	35,51	51,18	19,60	-9,10
DOE7_2	Case 0	N9501A_Index_3	3,34	37,10	21,70	53,30	1,10	3,60	10,4 + j 11,4	36,55	53,30	19,00	-6,50
DOE7_3	Case 0	N9501A_Index_4	4,7	37,30	20,00	54,50	1,00	4,20	8,5 + j 11,4	36,62	54,50	18,20	-5,00
	Case 0	N9500B_Index_11	5,6	37,50	19,40	53,50	0,90	4,10	8,5 + j 10	37,16	53,60	17,40	-4,50
	Case 1	N9501A_Index_1	1,94	36,50	24,50	49,00	1,30	3,11	11,3 + j 12,9	35,93	49,00	19,90	-7,70
	Case 1	N9501A_Index_3	3,34	37,00	22,10	51,10	1,10	3,81	9,4 + j 12,9	35,92	51,10	19,50	-5,90
	Case 1	N9501A_Index_4	4,7	37,20	20,00	53,60	1,00	4,31	8,5 + j 12,9	36,19	53,70	18,40	-5,20
	Case 1	N9500B_Index_11	5,6	37,40	19,40	53,00	0,80	4,31	7,6 + j 11,4	36,82	53,10	17,80	-4,00
	Case 2	N9501A_Index_1	1,94	36,60	22,60	46,20	1,30	3,32	11,1 + j 11,4	35,84	46,30	19,80	-8,10
	Case 2	N9501A_Index_3	3,34	37,10	20,70	47,70	0,23	3,42	5,3 + j 10	36,86	45,30	19,50	-1,30
	Case 2	N9501A_Index_4	4,7	37,30	19,30	46,00	0,50	4,32	5,3 + j 10	36,91	46,00	17,80	-2,50
	Case 2	N9500B_Index_11	5,6	37,10	18,90	43,60	0,40	4,22	4,8 + j 8,6	37,18	43,70	17,00	-2,40
	Case 3	N9501A_Index_1	1,94	36,50	23,00	49,30	1,20	3,13	11,1 + j 12,9	35,92	49,40	19,90	-7,50
	Case 3	N9501A_Index_3	3,34	37,00	21,10	51,60	1,00	3,53	10,3 + j 11,4	36,55	51,70	19,10	-6,00
DOE7_4	Case 3	N9501A_Index_4	4,7	37,20	19,70	54,40	1,10	4,23	8,7 + j 12,9	36,25	54,40	18,40	-5,30
DOE7_5	Case 3	N9500B_Index_11	5,6	37,40	19,10	53,80	0,80	4,33	7,9 + j 11,4	36,84	53,90	17,80	-4,20
	Case 3	N9500B_Index_3	6,59	37,30	18,70	49,90	0,60	4,53	6,4 + j 10	37,26	50,00	16,50	-2,60

## Initial selection

- › Caps 3,34 pF & 1,94 pF are not available in desired layout dimension 1010 x 207.
- › Ideally caps in between 1 and 3 pF are needed for optimum performance.
- › Re-simulated with smallest value available capacitors in both 1010x207 and 1446x207 dimensions
- › Results on next slide
- › For cap value > 5 pF, the contours are wobbly indicating a stability problem.
- › Different BW combinations are also tried for optimum performance.
- › Case 0 and Case 3 are chosen based on performance and used as input for simulation in the next slide

	Click for Graphs		
DOE type	Performance	Analysis	
Full DOE	Eff [%], Pout [dBm]		MOScap selection
			BW profile selection
Selected DOE	Eff [%], Pout [dBm]		



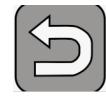
# DOE7\_simulated performance: MOScap (4) X (4) BW profile (with simple EM model):



P_0.5dB		Moscap				Max. performance @ P1.5dB			-_@ MXE							
DOE	BW_profile	Name	Index	RF top plate (X x Y)	Oxide thickness (μm)	Value (pF)	MXP (dBm)	MXG (dB)	MXE (%)	Zin_Re (Ω)	Zin_imag (Ω)	Z_L (Ω)	Pout (dBm)	Eff. (%)	Gt (dB)	IRL (dB)
	<a href="#">Case A</a>	N9501A	1	1446 x 351		1,94	36,70	24,30	51,10	1,30	3,20	11,3 + j 12,9	35,90	51,20	19,80	-7,80
DOE7_2	<a href="#">Case A</a>	N9501B_V8	16	1446x207	3100	3,53	37,20	21,50	54,00	1,10	3,60	10,4 + j 11,4	36,59	54,10	18,80	-6,50
DOE7_4	<a href="#">Case A</a>	N9501B_V4	12	1446 x 261	3100	4,46	37,30	20,50	53,80	0,80	4,10	7,2 + j 11,4	36,65	53,90	18,50	-4,10
	<a href="#">Case A</a>	N9501B	10	1446 x 207		5,52	37,50	19,70	50,90	0,50	4,20	7 + j 7	37,27	51,00	17,50	-2,40
	<a href="#">Case P</a>	N9500B_V7	4	1010 x 253	1950	4,64	37,30	20,00	54,50	1,00	4,20	8,5 + j 11,4	36,62	54,50	18,20	-5,00
	<a href="#">Case P</a>	N9500B_V2	11	1010 x 295	1950	5,41	37,50	19,40	53,50	0,90	4,10	8,5 + j 10	36,45	52,90	17,60	-5,00
	<a href="#">Case B</a>	N9501A	1	1446 x 351		1,94	36,80	25,80	53,60	1,40	2,20	11,3 + j 14,3	35,84	53,60	19,50	-7,60
DOE7_3	<a href="#">Case B</a>	N9501B_V8	16	1446x207	3100	3,53	37,30	24,00	56,00	1,20	2,70	9,7 + j 12,9	36,31	56,00	19,00	-7,00
DOE7_5	<a href="#">Case B</a>	N9501B_V4	12	1446 x 261	3100	4,46	37,40	23,20	55,70	0,90	2,90	8,5 + j 11,3	36,78	55,20	18,50	-5,60
	<a href="#">Case B</a>	N9501B	10	1446 x 207		5,52	37,70	22,40	51,90	0,70	3,00	7,2 + j 10	37,18	51,90	17,60	-4,10
	<a href="#">Case Q</a>	N9500B_V7	4	1010 x 253	1950	4,64	37,40	19,40	53,00	0,80	4,31	7,6 + j 11,4	36,82	53,10	17,80	-4,00
	<a href="#">Case Q</a>	N9500B_V2	11	1010 x 295	1950	5,41	37,50	19,40	55,60	0,90	4,20	8,4 + j 11,4	37,00	55,60	17,60	-4,50

› Re arranged DOE based on available caps in PL55 product catalogue file





# Selected DOE7 variants: Simple vs detailed EM simulation

Simple EM	P_0.5dB	Moscap					Max. performace @ P1.5dB			Performance @ MXE								
		DOE	BW_profile	Name	Index	RF top plate (X x Y)	Oxide thickness ( $\mu\text{m}$ )	Value (pF)	MXP (dBm)	MXG (dB)	MXE (%)	Zin_Re ( $\Omega$ )	Zin_imag ( $\Omega$ )	Z_L ( $\Omega$ )	Pout (dBm)	Eff. (%)	Gt (dB)	IRL (dB)
DOE7_1	Case vi								36,2	24,6	49	2,5	2,1	12,1 + j 17,3	36,39	49	19,4	-14,4
DOE7_2	Case A	N9501B_V8	16	1446x207		3100		3,53	37,20	21,50	54,00	1,10	3,60	10,4 + j 11,4	36,59	54,10	18,80	-6,50
DOE7_3	Case B	N9501B_V8	16	1446x207		3100		3,53	37,30	24,00	56,00	1,20	2,70	9,7 + j 12,9	36,31	56,00	19,00	-7,00
DOE7_4	Case A	N9501B_V4	12	1446 x 261		3100		4,46	37,30	20,50	53,80	0,80	4,10	7,2 + j 11,4	36,65	53,90	18,50	-4,10
DOE7_5	Case B	N9501B_V4	12	1446 x 261		3100		4,46	37,40	23,20	55,70	0,90	2,90	8,5 + j 11,3	36,78	55,20	18,50	-5,60

Detailed EM	P_0.5dB	Moscap					Max. performace @ P1.5dB			Performance @ MXE								
		DOE	BW_profile	Name	Index	RF top plate (X x Y)	Oxide thickness ( $\mu\text{m}$ )	Value (pF)	MXP (dBm)	MXG (dB)	MXE (%)	Zin_Re ( $\Omega$ )	Zin_imag ( $\Omega$ )	Z_L ( $\Omega$ )	Pout (dBm)	Eff. (%)	Gt (dB)	IRL (dB)
DOE7_1	Case vi/BW1g2g								36,2	24,6	49	2,5	2,1	12,1 + j 17,3	36,39	49	19,4	-14,4
DOE7_2	Case A/BW3g4g5g	N9501B_V8	16	1446x207		3100		3,53	36,7	21,8	50,7	1,3	3,1	11 + j 12,9	35,76	50,7	18,9	-8,1
DOE7_3	Case B/BW6g7g5g	N9501B_V8	16	1446x207		3100		3,53	36,7	22,9	53,6	1,1	1,9	11 + j 12,9	36,35	53,6	18,5	-5,7
DOE7_3	Case B/BW6g4g5g	N9501B_V8	16	1446x207		3100		3,53	36,6	23,3	51,6	1,2	2,0	11 + j 12,9	35,93	51,7	18,7	-6,6
DOE7_4	Case A/BW3g4g5g	N9501B_V4	12	1446 x 261		3100		4,46	36,8	20,7	53,1	1,3	3,5	11 + j 12,9	36,1	53,1	18,3	-7,5
DOE7_5	Case B/BW6g4g5g	N9501B_V4	12	1446 x 261		3100		4,46	36,8	22,3	53,8	1,2	2,3	11 + j 12,9	36,23	53,8	18,3	-6,7
DOE7_5	Case B/BW6g7g5g	N9501B_V4	12	1446 x 261		3100		4,46	36,8	22,1	55	0,9	2,4	9,7 + j 12,9	36,39	55	18,5	-5,2

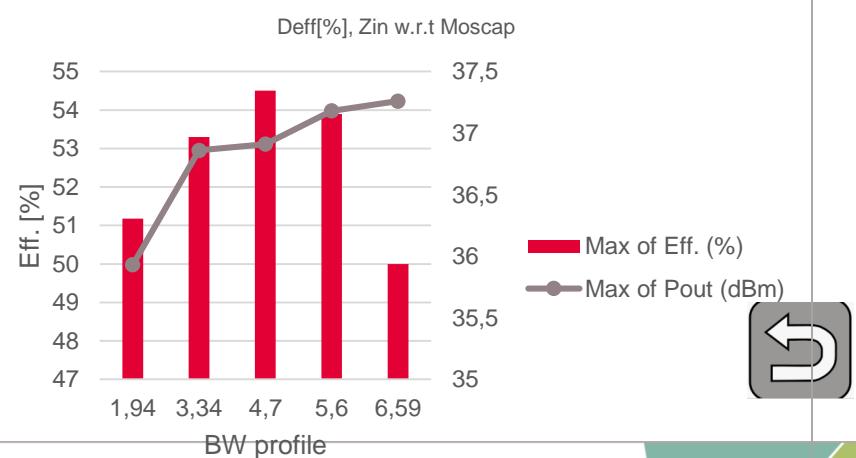
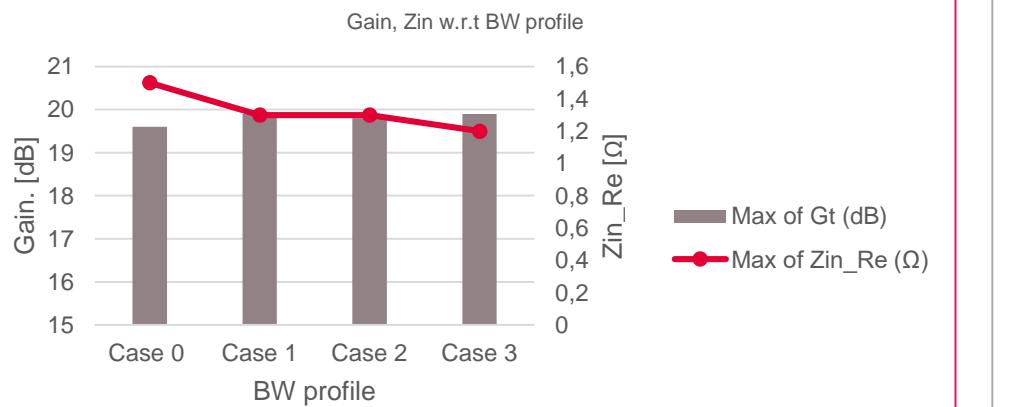
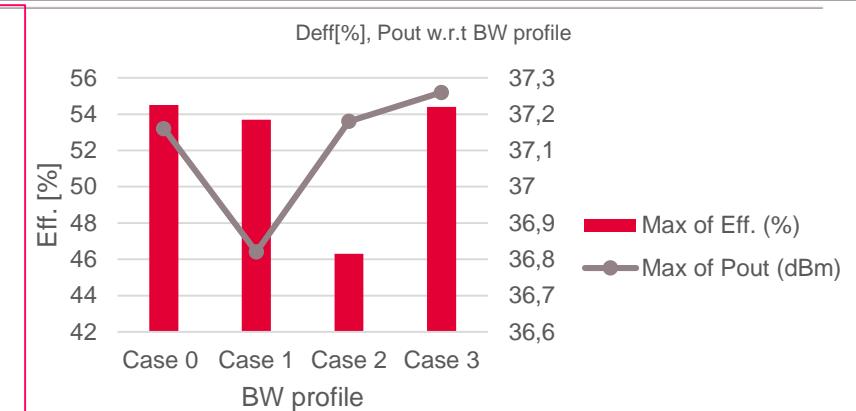
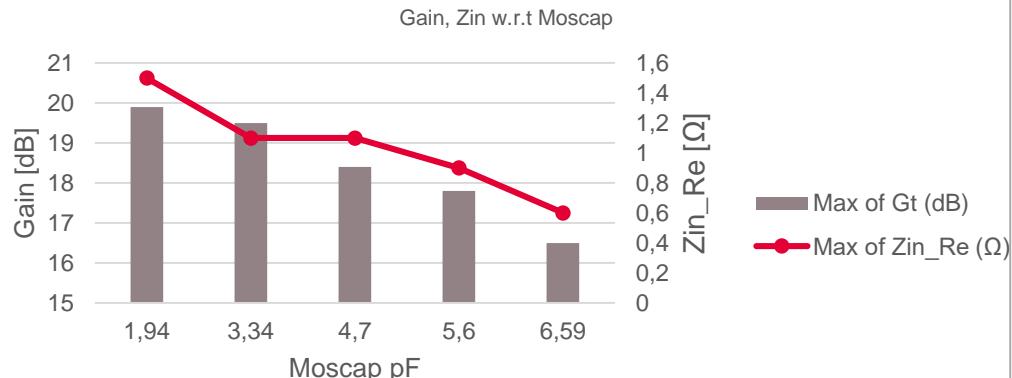


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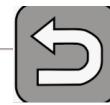
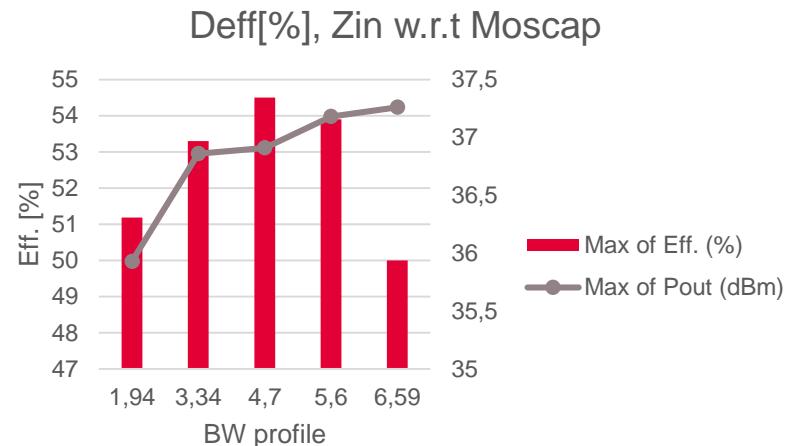
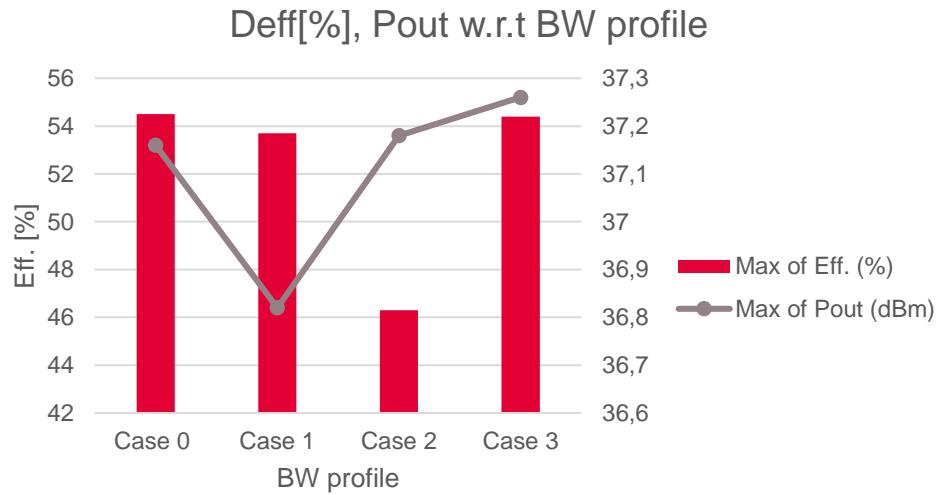
# DOE6

## Performance Graphs & Analysis

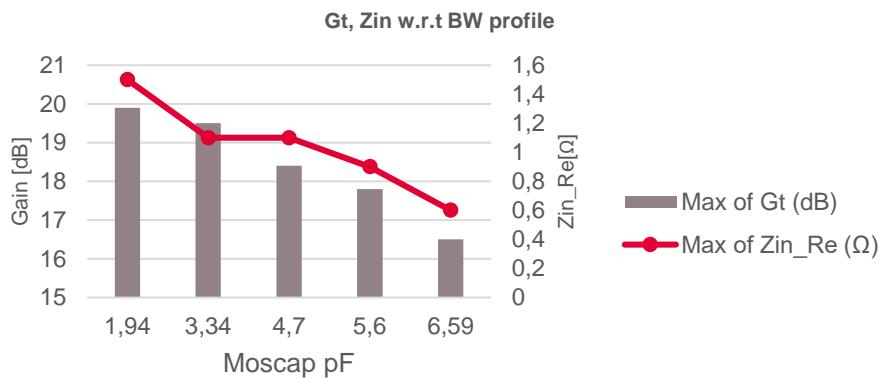
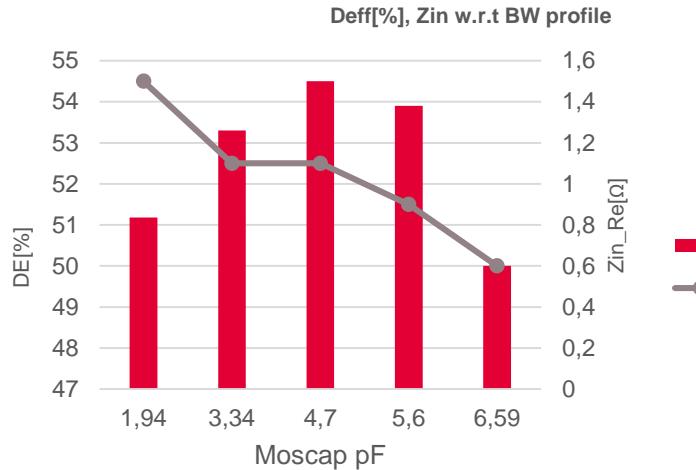
# Zin & Gt @ ZL w.r.t BW config. & MOScap



# Eff. & Pout @ ZL w.r.t BW config. & MOScap



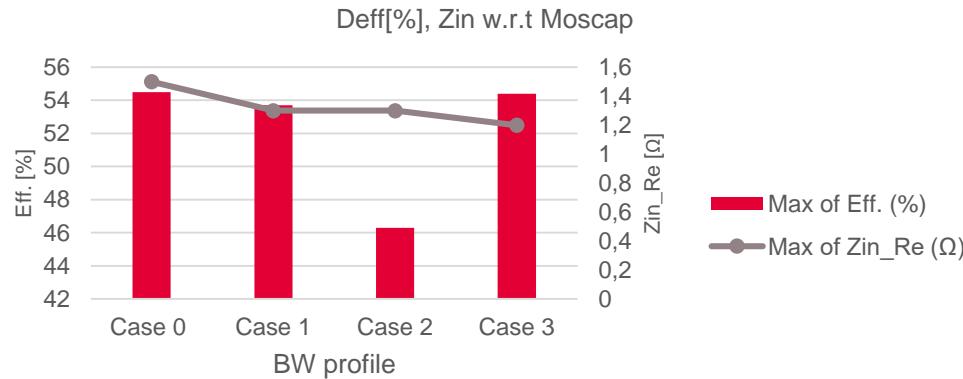
# MOScap selection



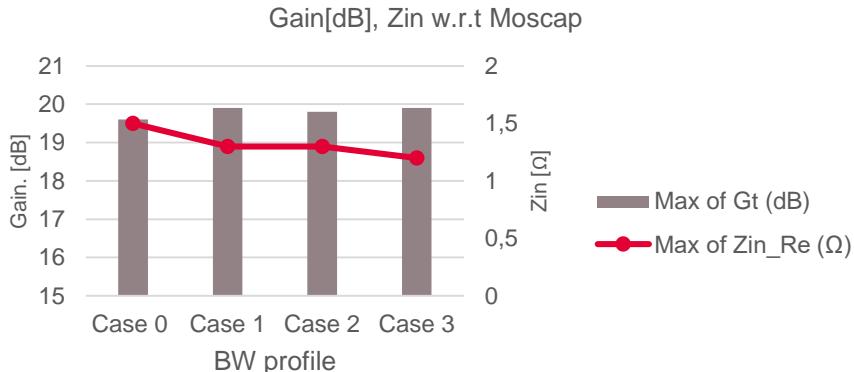
- › **PassFail**
- › Criteria: As high Eff. , Gt & Zin{Re} as possible  
When Pout (dBm) > 35,5 dBm
- › Selected MOScap
  - › **3,34 pF, 4,7pF & 5,6 pF**
  - › 1,94 pF is not available



# BW configuration selection

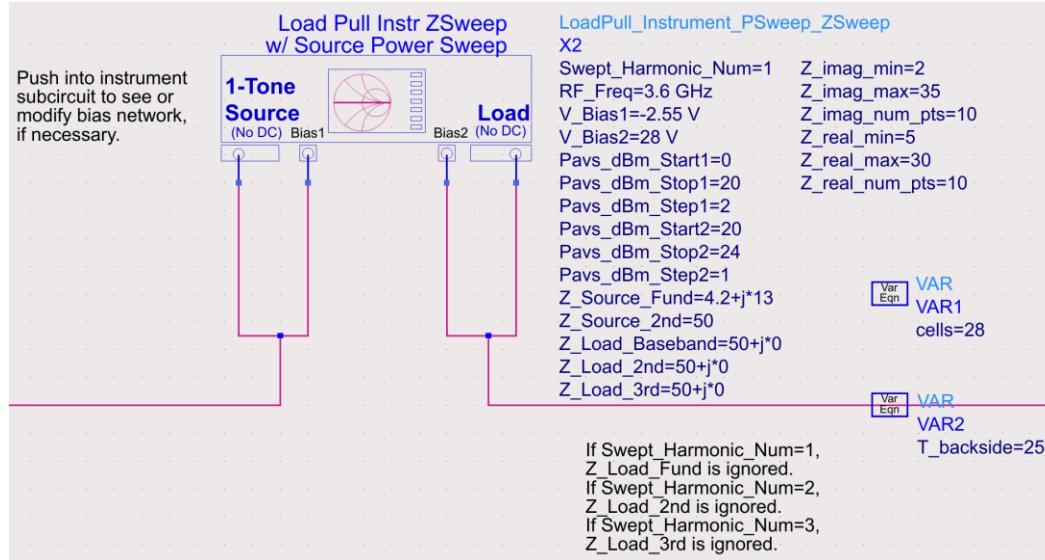
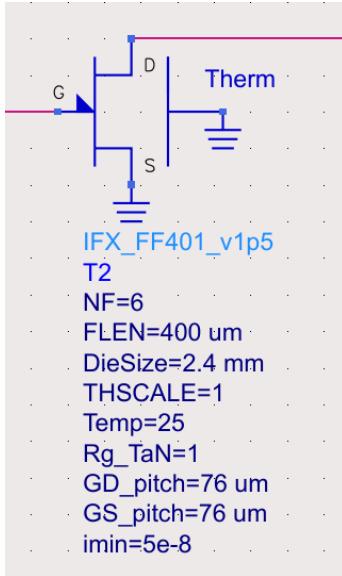


- › Pass/Fail
- › Criteria: As high Eff. , Gt & Zin{Re} as possible  
When Pout (dBm) > 35,5 dBm
- › Selected BW. Config
- › Case 0 & case 3

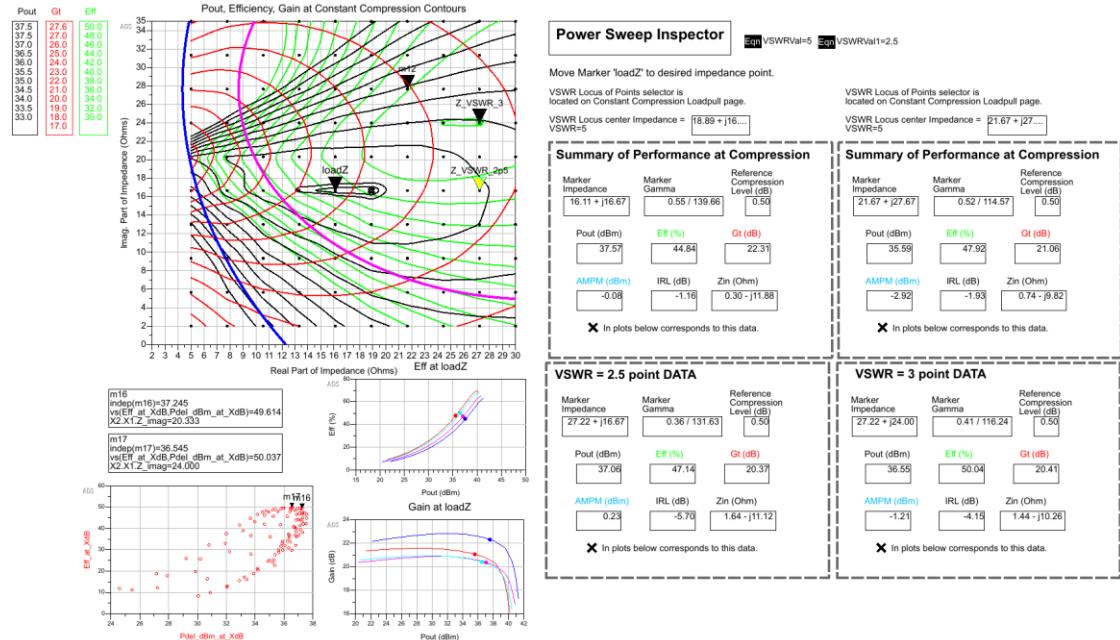


# Simulation Results

# Bare die GaN Load-pull: T9507B\_2

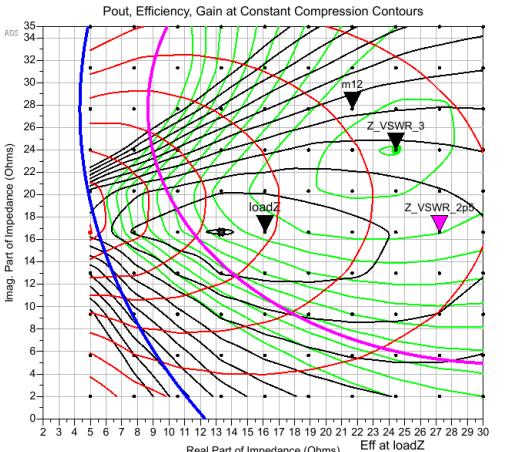


# LP summary 2,4 mm die @ 3.4 GHz



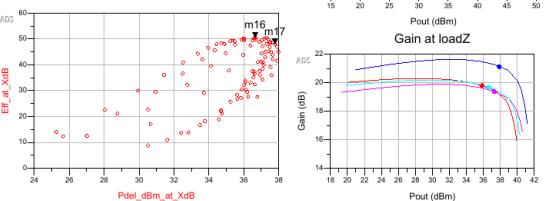
# LP summary 2,4 mm die @ 3.6 GHz

Pout	Gt	Eff
37.9	24.4	50.6
37.5	24.0	50.0
37.0	23.0	48.0
36.5	22.0	46.0
36.0	21.0	44.0
35.5	20.0	42.0
35.0	19.0	40.0
34.5	18.0	38.0
34.0	17.0	36.0
33.5		34.0
33.0		32.0



m16  
indep(m16)=36.648  
vs(Eff\_at\_XdB\_Pdel\_dBm\_at\_XdB)=50.648  
X2\_X1\_Z\_imag=24.000

m17  
indep(m17)=37.780  
vs(Eff\_at\_XdB\_Pdel\_dBm\_at\_XdB)=48.158  
X2\_X1\_Z\_imag=16.667



## Power Sweep Inspector

EdnVSWRVal=5 EdnVSWRVal=2.5

Move Marker 'loadZ' to desired impedance point.

VSWR Locus of Points selector is located on Constant Compression Loadpull page.

VSWR center Impedance =  $13.33 + j16 \dots$   
VSWR=5

## Summary of Performance at Compression

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$16.11 + j16.67$	$0.55 / 139.66$	0.50
Pout (dBm)	Eff (%)	Gt (dB)
37.89	46.99	21.13
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-0.37	-1.55	$0.45 - j11.14$

✗ In plots below corresponds to this data.

## Summary of Performance at Compression

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$21.67 + j27.67$	$0.52 / 114.57$	0.50
Pout (dBm)	Eff (%)	Gt (dB)
35.86	49.66	19.79
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-2.19	-2.12	$0.95 - j9.17$

✗ In plots below corresponds to this data.

## VSWR = 2.5 point DATA

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$27.22 + j16.67$	$0.36 / 131.63$	0.50
Pout (dBm)	Eff (%)	Gt (dB)
37.30	48.10	19.38
AMPM (dBm)	IRL (dB)	Zin (Ohm)
0.77	-5.22	$1.73 - j0.46$

✗ In plots below corresponds to this data.

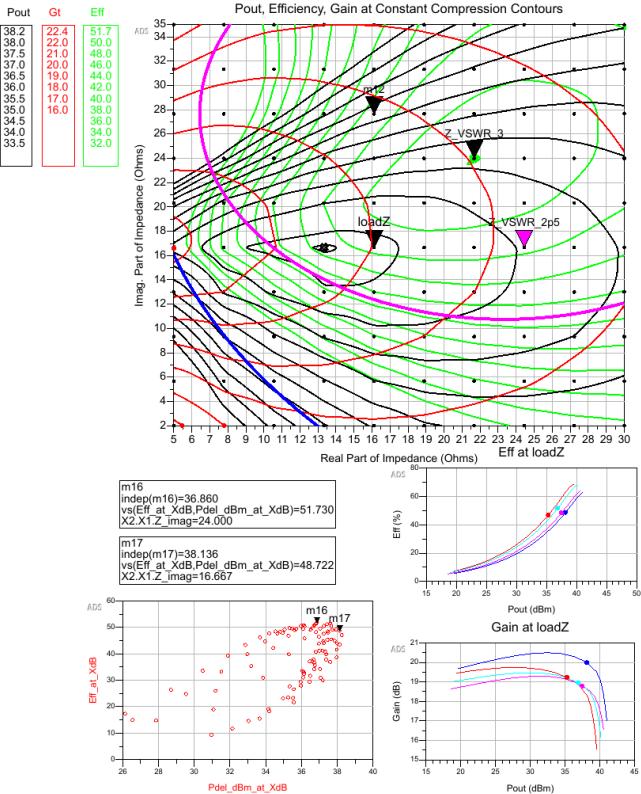
## VSWR = 3 point DATA

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$24.44 + j24.00$	$0.45 / 118.93$	0.50
Pout (dBm)	Eff (%)	Gt (dB)
36.65	50.65	19.68
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-1.22	-3.22	$1.29 - j9.65$

✗ In plots below corresponds to this data.



# LP summary 2,4 mm die @ 3.8 GHz



## Power Sweep Inspector

Eqn VSWRVal=5 Eqn VSWRVa1=2.5

Move Marker 'loadZ' to desired impedance point.

VSWR Locus Points selector is located on Constant Compression Loadpull page.

VSWR Locus center Impedance =  $13.33 + j16\ldots$   
VSWR=5

VSWR Locus Points selector is located on Constant Compression Loadpull page.

VSWR Locus center Impedance =  $16.11 + j27\ldots$   
VSWR=5

## Summary of Performance at Compression

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$16.11 + j16.67$	$0.55 / 139.66$	0.50
Pout (dBm)	Eff (%)	Gt (dB)
38.14	48.72	19.99
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-0.63	-1.76	$0.58 - j10.45$

✗ In plots below corresponds to this data.

## Summary of Performance at Compression

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$16.11 + j27.67$	$0.61 / 118.06$	0.50
Pout (dBm)	Eff (%)	Gt (dB)
35.27	46.91	19.23
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-3.66	-0.69	$0.36 - j8.48$

✗ In plots below corresponds to this data.

## VSWR = 2.5 point DATA

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$24.44 + j16.67$	$0.40 / 134.27$	0.50
Pout (dBm)	Eff (%)	Gt (dB)
37.47	48.51	18.79
AMPM (dBm)	IRL (dB)	Zin (Ohm)
0.85	-4.20	$1.56 - j9.98$

✗ In plots below corresponds to this data.

## VSWR = 3 point DATA

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$21.67 + j24.00$	$0.49 / 121.22$	0.50
Pout (dBm)	Eff (%)	Gt (dB)
36.86	51.73	18.98
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-1.46	-2.45	$1.12 - j9.08$

✗ In plots below corresponds to this data.

# Power scaling (based on simulation)

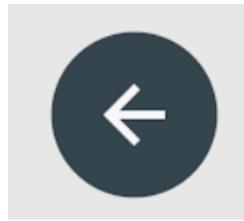
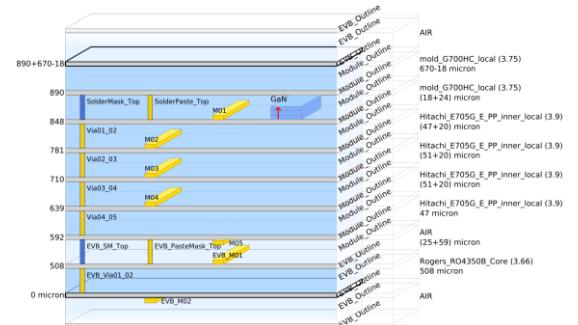
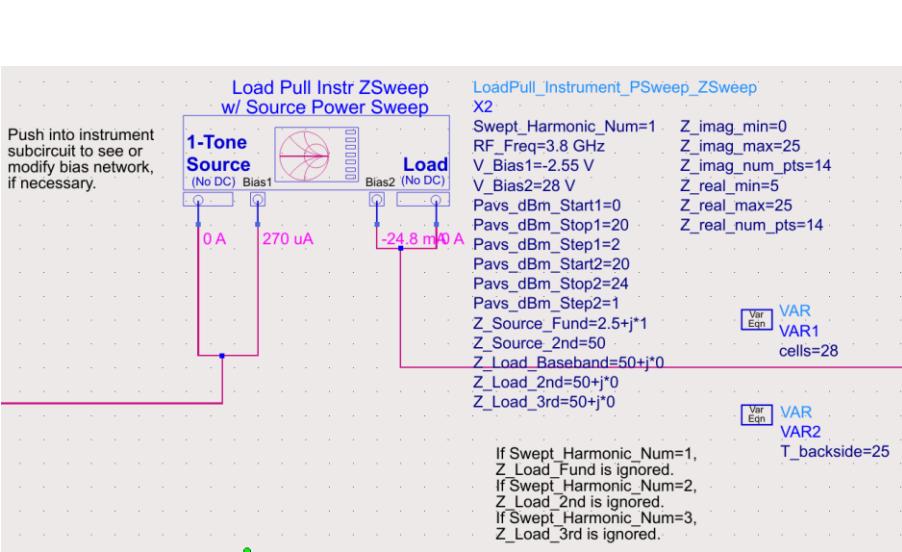
Available dies	Device geometry (mm)	Power scaling (W/mm)	Power deliverd (dBm)	Power deliverd (W)
P19	5,76	(24x240um)		
P6	5,76	36x160um		
P3	4,8	30x160um	3,88	
P14	5,12	16X320um		
P76	10,1	42x240 um		
T9503A_1	12	30X400um	5,48	
P39	11,52	36x320um		
P35	10,24	32x320um		
T9507B_2	2,4	6x400um		
P47_RF	1,92	8X240um		
P13	3,84	12X320um		
P10	3,84	16X240um		
P15	6,4	20X320um		
P15	6,4	20X320um		

Update

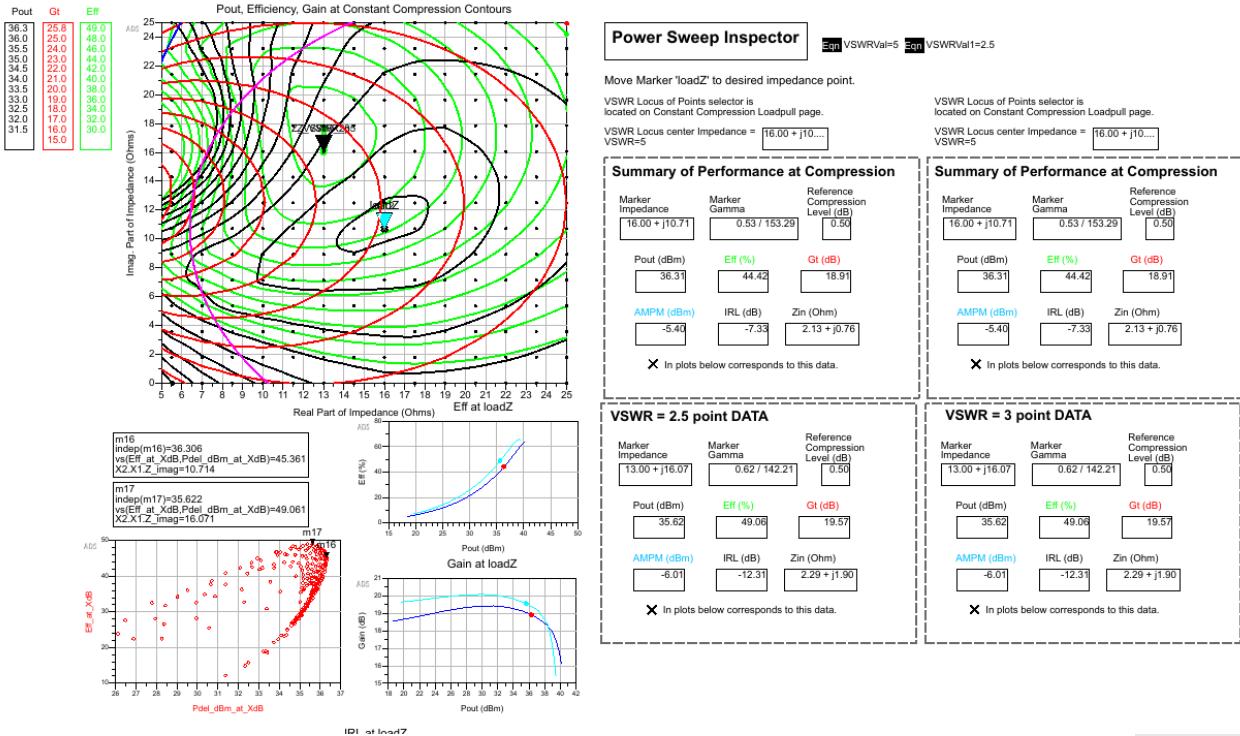
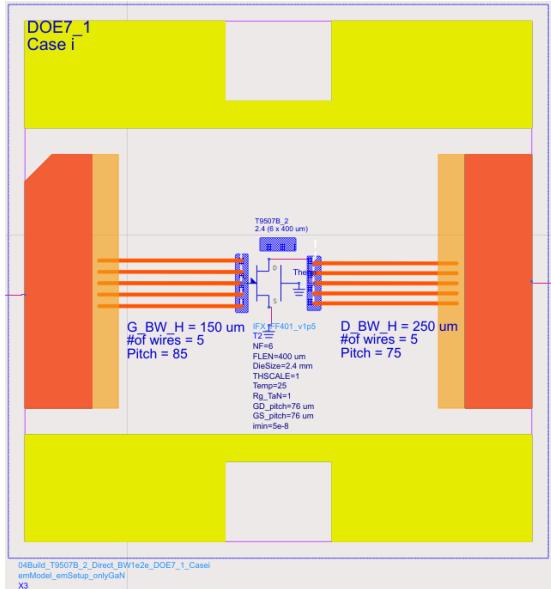
- › Update for
- › P1.5 dB, P3dB

- › 12 mm die has lot of power
  - › 65 W worst case vs needed 45 W worst case
  - › Can be made operated slightly lower than Class C enabling Main to match for more gain
- › Input matching can be designed for Max gain & reasonable gain still having enough power to deliver.

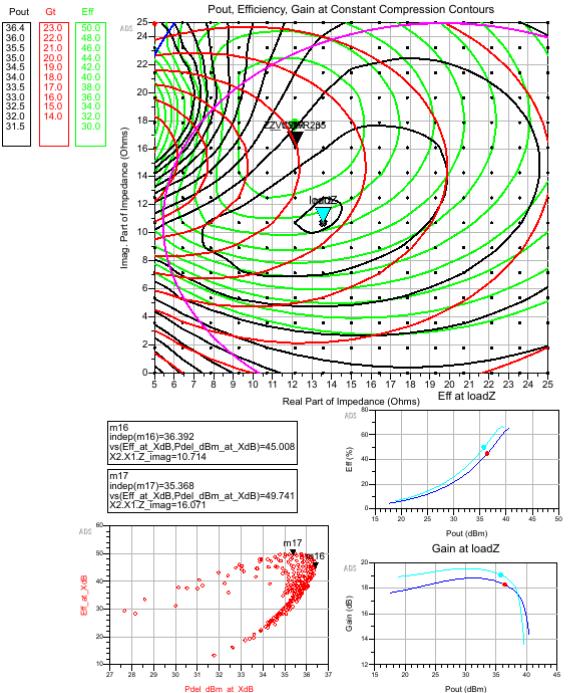
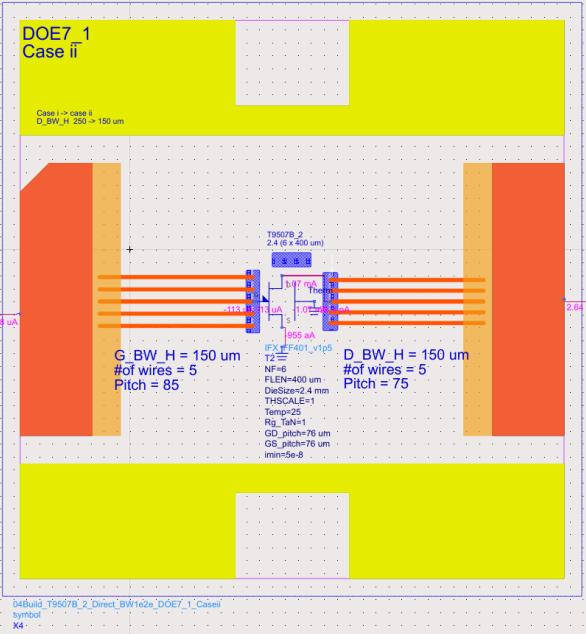
# BW + GaN + LAC3839: Simple EM simulation



# Case i: 3,6 GHz



# Case ii:



## Power Sweep Inspector

VSWRVal=5  VSWRVal=1+2.5

Move Marker 'loadZ' to desired impedance point.

VSWR Locus of Points selector is located on Constant Compression Loadpull page.  
VSWR center Impedance =  $13.57 + j10.71$

VSWR=5

VSWR Locus of Points selector is located on Constant Compression Loadpull page.  
VSWR center Impedance =  $13.57 + j10.71$

VSWR=5

## Summary of Performance at Compression

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$13.57 + j10.71$	$0.59 / 154.04$	0.50
Pout (dBm)	Eff (%)	Gt (dB)
36.39	45.01	18.29
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-7.88	-4.00	$1.75 - j0.51$

## VSWR = 2.5 point DATA

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$12.14 + j16.07$	$0.64 / 142.50$	0.50
Pout (dBm)	Eff (%)	Gt (dB)
35.74	49.98	19.04
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-7.80	-6.67	$2.08 + j0.55$

X in plots below corresponds to this data.

## Summary of Performance at Compression

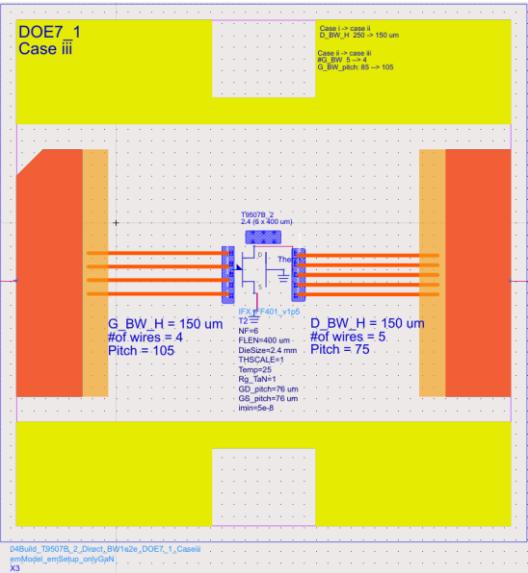
Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$13.57 + j10.71$	$0.59 / 154.04$	0.50
Pout (dBm)	Eff (%)	Gt (dB)
36.39	45.01	18.29
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-7.88	-4.00	$1.75 - j0.51$

## VSWR = 3 point DATA

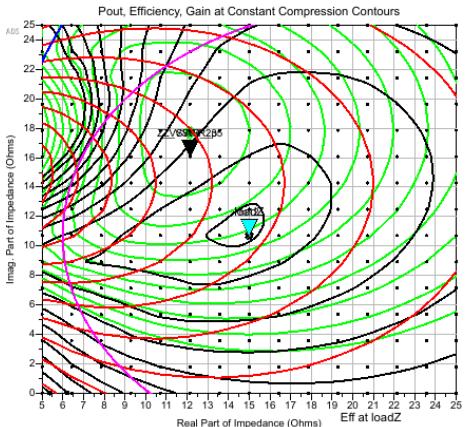
Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$12.14 + j16.07$	$0.64 / 142.50$	0.50
Pout (dBm)	Eff (%)	Gt (dB)
35.74	49.98	19.04
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-7.80	-6.67	$2.08 + j0.55$

X in plots below corresponds to this data.

# Case iii:

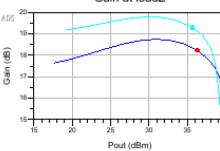
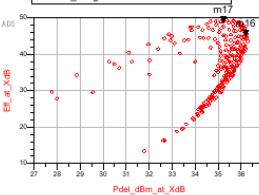


Pout	Gt	Eff
36.2	23.5	49.4
36.0	23.0	48.0
35.5	22.0	46.0
35.0	21.0	44.0
34.5	20.0	42.0
34.0	19.0	40.0
33.5	18.0	38.0
33.0	17.0	36.0
32.5	16.0	34.0
32.0	15.0	32.0
31.5	14.0	30.0



```
m16
indep(m16)=36.194
vs(Eff_at_XdB,Pdel_dBm_at_XdB)=45.260
X2.X1.Z_imag=j10.714
```

```
m17
indep(m17)=35.220
vs(Eff_at_XdB,Pdel_dBm_at_XdB)=48.966
X2.X1.Z_imag=j16.071
```



## Power Sweep Inspector

Edit VSWRVal=5 Edit VSWRVal=1.25

Move Marker 'loadZ' to desired impedance point.

VSWR Locus of Points selector is located on Constant Compression Loadpull page.

VSWR Locus center Impedance =  $15.00 + j10.71$   
VSWR=5

VSWR Locus of Points selector is located on Constant Compression Loadpull page.

VSWR Locus center Impedance =  $15.00 + j10.71$   
VSWR=5

## I Summary of Performance at Compression

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$15.00 + j10.71$	0.56 / 153.62	0.50
Pout (dBm)	Eff (%)	Gt (dB)
36.27	43.60	18.24
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-6.33	-4.74	$1.96 + j0.29$

X In plots below corresponds to this data.

## II Summary of Performance at Compression

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$15.00 + j10.71$	0.56 / 153.62	0.50
Pout (dBm)	Eff (%)	Gt (dB)
36.27	43.60	18.24
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-6.33	-4.74	$1.96 + j0.29$

X In plots below corresponds to this data.

## VSWR = 2.5 point DATA

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$12.14 + j16.07$	0.64 / 142.50	0.50
Pout (dBm)	Eff (%)	Gt (dB)
35.65	49.34	19.29
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-7.25	-7.65	$2.11 + j0.89$

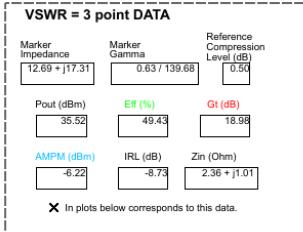
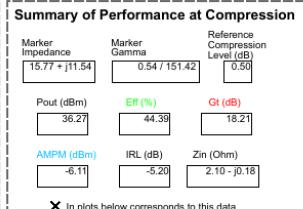
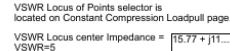
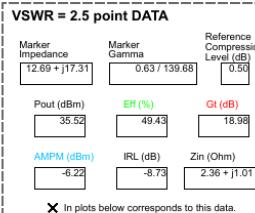
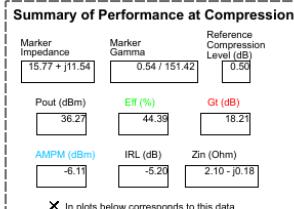
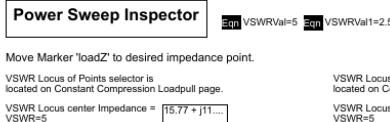
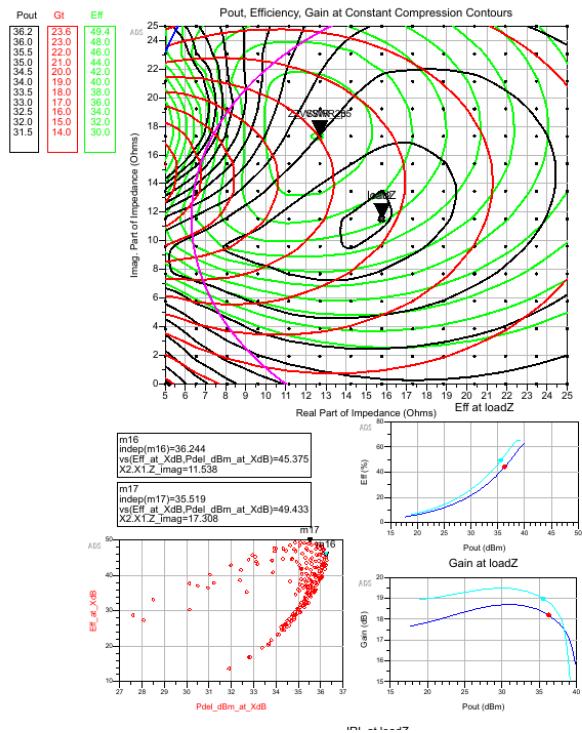
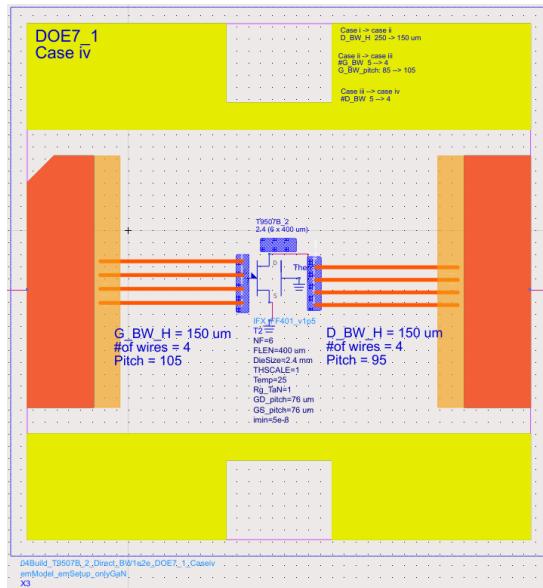
X In plots below corresponds to this data.

## VSWR = 3 point DATA

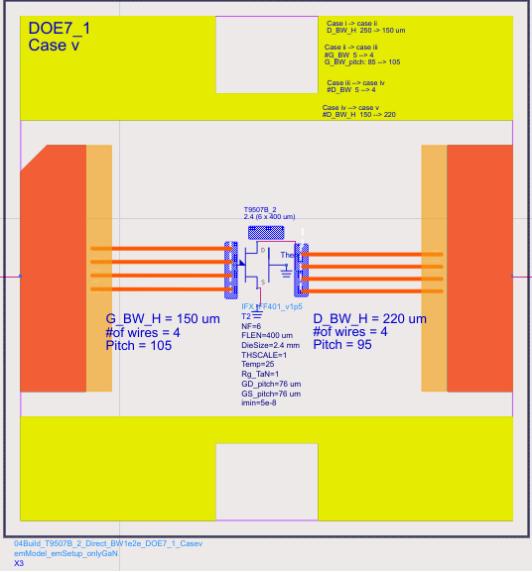
Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$12.14 + j16.07$	0.64 / 142.50	0.50
Pout (dBm)	Eff (%)	Gt (dB)
35.65	49.34	19.29
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-7.25	-7.65	$2.11 + j0.89$

X In plots below corresponds to this data.

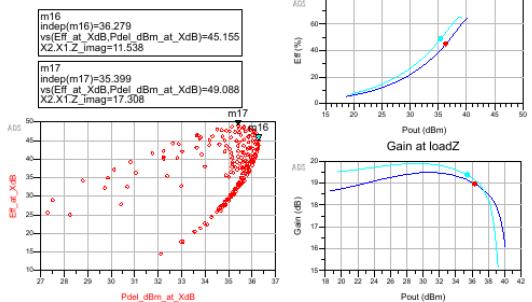
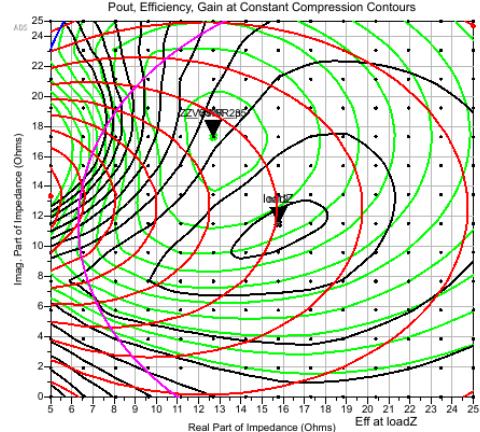
### Case iv:



# Case V:



Pout	Gr	Eff
36.2	24.6	49.0
36.5	24.0	48.0
35.5	23.0	46.0
35.0	22.0	44.0
34.5	21.0	42.0
34.0	20.0	40.0
33.5	19.0	38.0
33.0	18.0	36.0
32.5	17.0	34.0
32.0	16.0	32.0
31.5		30.0



## Power Sweep Inspector

Eqn VSWRVal=5 Eqn VSWRVal=2.5

Move Marker 'loadZ' to desired impedance point.

VSWR Locus of Points selector is located on Constant Compression Loadpull page.

VSWR Locus center Impedance =  $15.77 + j11.54$   
VSWR=5

## Summary of Performance at Compression

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
15.77 + j11.54	0.54 / 151.42	0.50
Pout (dBm)	36.28	45.18
AMPM (dBm)	-5.56	18.97
IRL (dB)	-7.62	Zin (Ohm)
	2.16 + j0.83	

× In plots below corresponds to this data.

VSWR Locus of Points selector is located on Constant Compression Loadpull page.

VSWR Locus center Impedance =  $15.77 + j11.54$   
VSWR=5

## Summary of Performance at Compression

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
15.77 + j11.54	0.54 / 151.42	0.50
Pout (dBm)	36.28	45.15
AMPM (dBm)	-5.56	18.97
IRL (dB)	-7.62	Zin (Ohm)
	2.16 + j0.83	

× In plots below corresponds to this data.

## VSWR = 2.5 point DATA

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
12.69 + j17.31	0.63 / 139.68	0.50
Pout (dBm)	35.40	49.09
AMPM (dBm)	-5.46	19.39
IRL (dB)	-13.95	Zin (Ohm)
	2.45 + j2.04	

× In plots below corresponds to this data.

## VSWR = 3 point DATA

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
12.69 + j17.31	0.63 / 139.68	0.50
Pout (dBm)	35.40	49.09
AMPM (dBm)	-5.46	19.39
IRL (dB)	-13.95	Zin (Ohm)
	2.45 + j2.04	

× In plots below corresponds to this data.

# Case vi:

DOE7\_1  
Case vi

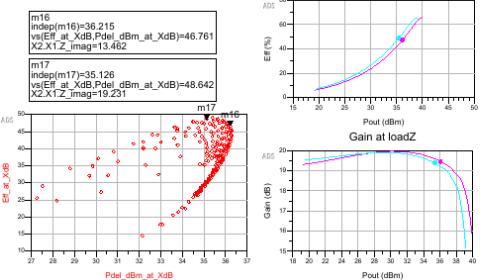
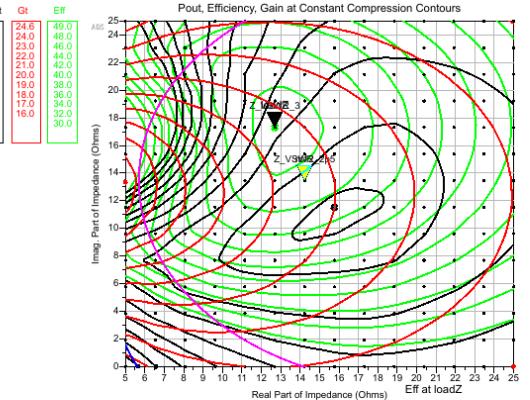
G\_BW\_H = 125 um  
#of wires = 4  
Pitch = 105

D\_BW\_H = 220 um  
#of wires = 4  
Pitch = 95

04Build\_T9507B\_2\_Direct\_BW1e2e\_DOE7\_1\_Casevi  
symbol  
x3

Case i → case ii  
D\_BW\_H 250 → 150 um  
Case ii → case iii  
G\_BW\_H 5 → 4  
G\_BW\_pitch: 85 → 105  
Case iii → case iv  
#D\_BW 5 → 4  
Case iv → case v  
D\_BW\_H 150 → 220  
Case v → case vi  
#D\_BW\_H 150 → 125  
Case vi → case vi

Pout	Gt	Eff
36.2	24.6	40.0
36.0	24.0	40.0
35.5	23.0	40.0
35.0	22.0	40.0
34.5	21.0	40.0
34.0	20.0	40.0
33.5	19.0	38.0
33.0	18.5	38.0
32.5	17.0	34.0
32.0	16.0	32.0
31.5	16.0	30.0



## Power Sweep Inspector

Move Marker 'loadZ' to desired impedance point.

VSWR Locus of Points selector is located on Constant Compression Loadpull page.

VSWR Locus center Impedance =  $[15.77 + j11]$

## Summary of Performance at Compression

Marker Impedance	Marker Gamma	Reference Compensation Level (dB)
$12.69 + j17.31$	0.63 / 139.68	-0.50
35.39	49.06	19.40
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-5.42	-14.40	2.46 + j2.10

× In plots below corresponds to this data.

VSWR Locus of Points selector is located on Constant Compression Loadpull page.

VSWR Locus center Impedance =  $[14.23 + j13]$

## Summary of Performance at Compression

Marker Impedance	Marker Gamma	Reference Compensation Level (dB)
$14.23 + j13.46$	0.58 / 147.54	-0.50
36.07	47.41	19.46
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-6.28	-9.29	2.15 + j1.34

× In plots below corresponds to this data.

## VSWR = 2.5 point DATA

Marker Impedance	Marker Gamma	Reference Compensation Level (dB)
$14.23 + j13.46$	0.58 / 147.54	-0.50
36.07	47.41	19.46
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-6.28	-9.29	2.15 + j1.34

× In plots below corresponds to this data.

## VSWR = 3 point DATA

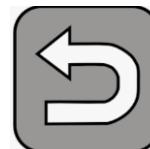
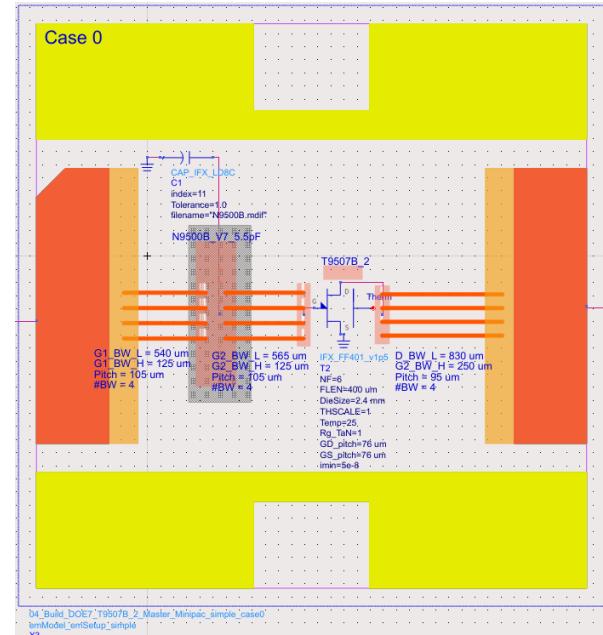
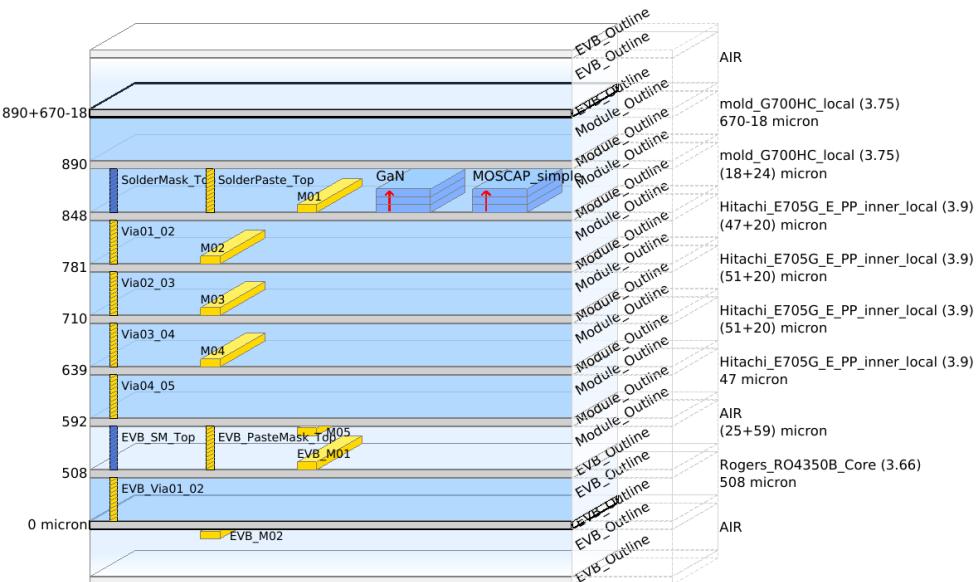
Marker Impedance	Marker Gamma	Reference Compensation Level (dB)
$12.69 + j17.31$	0.63 / 139.68	-0.50
35.39	49.06	19.40
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-5.42	-14.40	2.46 + j2.10

× In plots below corresponds to this data.

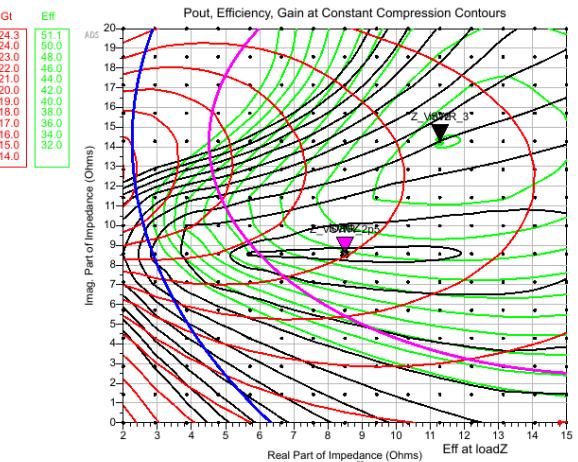
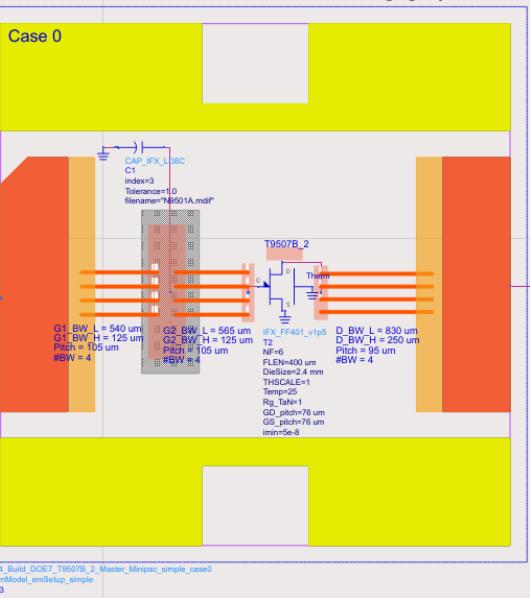
# LP simulations with simple EM model

## Case 0

Substrate Name: LAC\_Lam5L\_nest\_simple

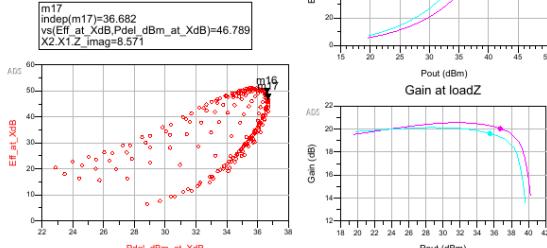


# Case 0: 1,34 pF Moscap, N9501A, index 1



m16  
indep(m16)=36.595  
vstEff at XdB.Pdel\_dBm\_at\_XdB)=49.147  
X2.X1.Z\_imag=10.000

m17  
indep(m17)=36.692  
vstEff at XdB.Pdel\_dBm\_at\_XdB)=46.789  
X2.X1.Z\_imag=8.571



## Power Sweep Inspector

Eqn VSWRVal=5 Eqn VSWRVal=2.5

Move Marker 'loadZ' to desired impedance point.

VSWR Locus of Points selector is located on Constant Compression Loadpull page.  
VSWR Locus center Impedance =  $8.50 + j8.57$

VSWR Locus of Points selector is located on Constant Compression Loadpull page.  
VSWR Locus center Impedance =  $11.29 + j14.29$   
VSWR=5

## Summary of Performance at Compression

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$8.50 + j8.57$	0.72 / 159.99	0.50
Pout (dBm)	Eff (%)	Gt (dB)
36.70	45.75	20.04
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-9.84	-3.47	$0.60 + j2.66$

✗ In plots below corresponds to this data.

## Summary of Performance at Compression

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$11.29 + j14.29$	0.66 / 146.62	0.50
Pout (dBm)	Eff (%)	Gt (dB)
35.51	51.18	19.63
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-9.64	-9.07	$1.46 + j3.30$

✗ In plots below corresponds to this data.

## VSWR = 2.5 point DATA

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$8.50 + j8.57$	0.72 / 159.99	0.50
Pout (dBm)	Eff (%)	Gt (dB)
36.70	45.75	20.04
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-9.84	-3.47	$0.60 + j2.66$

✗ In plots below corresponds to this data.

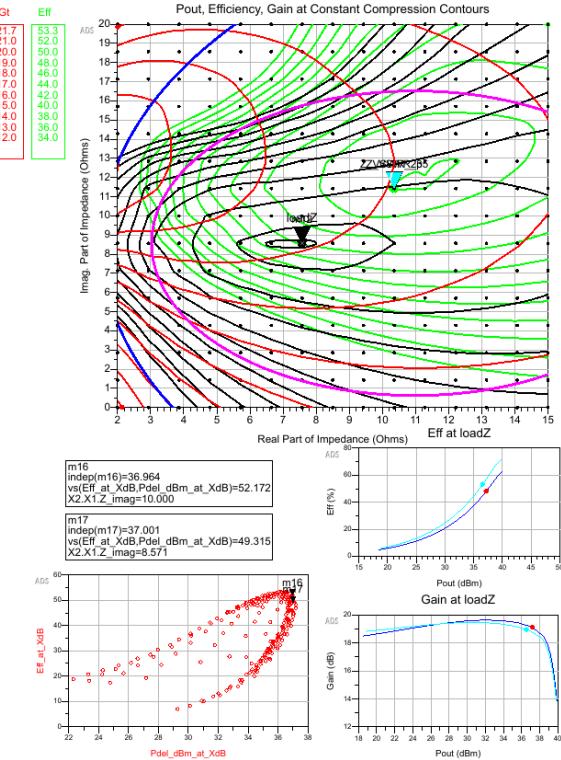
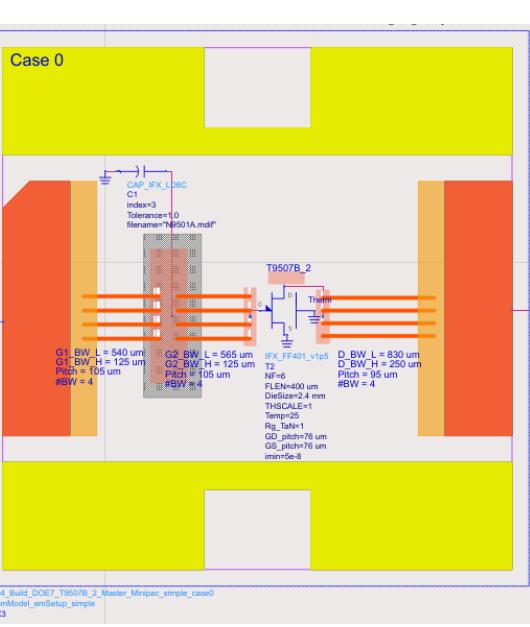
## VSWR = 3 point DATA

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$11.29 + j14.29$	0.66 / 146.62	0.50
Pout (dBm)	Eff (%)	Gt (dB)
35.51	51.18	19.63
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-9.64	-9.07	$1.46 + j3.30$

✗ In plots below corresponds to this data.



# Case 0: 3,34 pF Moscap, N9501A, index 3



## Power Sweep Inspector

Eqn VSWRVal=5 Eqn VSWRVal=2.5

Move Marker 'loadZ' to desired impedance point.

VSWR Locus of Points selector is located on Constant Compression Loadpull page.

VSWR Locus center Impedance =  $7.57 + j8.57$

VSWR Locus of Points selector is located on Constant Compression Loadpull page.

VSWR Locus center Impedance =  $7.57 + j8.57$

## Summary of Performance at Compression

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$7.57 + j8.57$	$0.74 / 160.11$	0.50
Pout (dBm)	Eff (%)	Gt (dB)
37.18	48.25	19.13
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-10.52	-2.95	$0.51 + j3.35$

X In plots below corresponds to this data.

## Summary of Performance at Compression

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$7.57 + j8.57$	$0.74 / 160.11$	0.50
Pout (dBm)	Eff (%)	Gt (dB)
37.18	48.25	19.13
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-10.52	-2.95	$0.51 + j3.35$

X In plots below corresponds to this data.

## VSWR = 2.5 point DATA

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$10.36 + j11.43$	$0.67 / 153.20$	0.50
Pout (dBm)	Eff (%)	Gt (dB)
36.55	53.34	18.96
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-11.35	-6.47	$1.12 + j3.60$

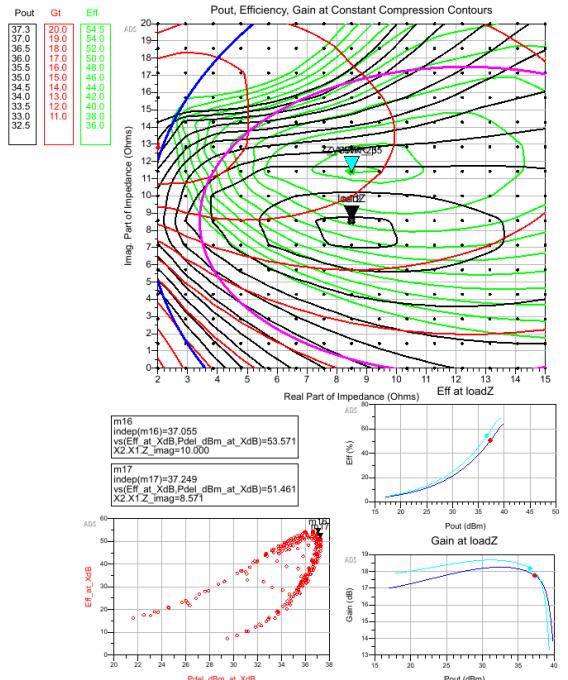
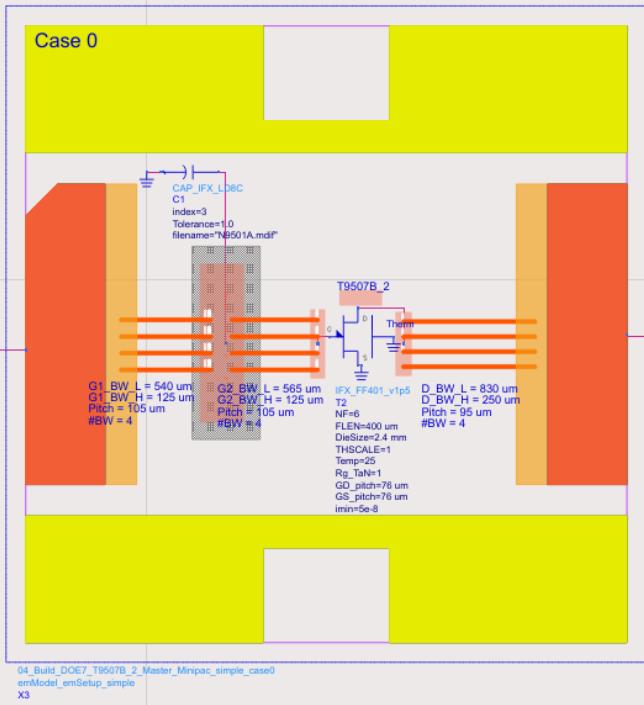
X In plots below corresponds to this data.

## VSWR = 3 point DATA

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$10.36 + j11.43$	$0.67 / 153.20$	0.50
Pout (dBm)	Eff (%)	Gt (dB)
36.55	53.34	18.96
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-11.35	-6.47	$1.12 + j3.60$

X In plots below corresponds to this data.

# Case 0: 4.7 pF Moscap, N9501A, index 4



## Power Sweep Inspector

VSWRVal=6 VSWRVal=2.5

Move Marker 'loadZ' to desired impedance point.

VSWR Locus of Points selector is located on Constant Compression Loadpull page.

VSWR Locus center Impedance =  $8.50 + j8.57$   
 VSWR=5

## Summary of Performance at Compression

Marker Impedance:  $8.50 + j8.57$ , Marker Gamma:  $0.72 / 159.99$ , Reference Compression Level (dB): 0.50

Pout (dBm): 37.31, Eff (%): 50.70, Gt (dB): 17.75  
 AMPM (dBm): -11.48, IRL (dB): -4.00, Zin (Ohm):  $0.73 + j3.82$

**VSWR = 2.5 point DATA**

Marker Impedance:  $8.50 + j11.43$ , Marker Gamma:  $0.72 / 153.55$ , Reference Compression Level (dB): 0.50

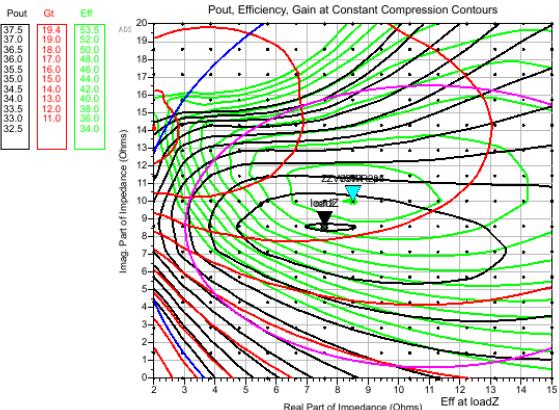
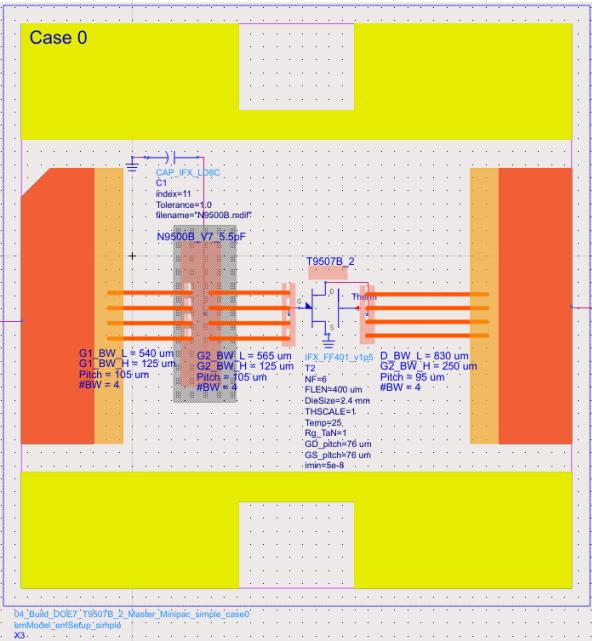
Pout (dBm): 36.62, Eff (%): 54.51, Gt (dB): 18.17  
 AMPM (dBm): -14.48, IRL (dB): -4.99, Zin (Ohm):  $0.97 + j4.14$

**VSWR = 3 point DATA**

Marker Impedance:  $8.50 + j11.43$ , Marker Gamma:  $0.72 / 153.55$ , Reference Compression Level (dB): 0.50

Pout (dBm): 36.62, Eff (%): 54.51, Gt (dB): 18.17  
 AMPM (dBm): -14.48, IRL (dB): -4.99, Zin (Ohm):  $0.97 + j4.14$

# Case 0 : Moscap 5,29 pF (index 11), P0.5dB,



## Power Sweep Inspector

Eqn VSWRVal=5 Eqn VSWRVal=2.5

Move Marker 'loadZ' to desired impedance point.

VSWR Locus of Points selector is located on Constant Compression Loadpull page.

VSWR Locus center Impedance =  $7.57 + j8.57$

VSWR=5

VSWR Locus of Points selector is located on Constant Compression Loadpull page.

VSWR Locus center Impedance =  $7.57 + j8.57$

VSWR=5

## Summary of Performance at Compression

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$7.57 + j8.57$	0.74 / 160.11	0.50

Pout (dBm)	Eff (%)	Gt (dB)
37.50	50.88	17.21

AMPM (dBm)	IRL (dB)	Zin (Ohm)
-12.69	-3.33	$0.64 + j4.04$

X In plots below corresponds to this data.

## Summary of Performance at Compression

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$7.57 + j8.57$	0.74 / 160.11	0.50

Pout (dBm)	Eff (%)	Gt (dB)
37.50	50.88	17.21

AMPM (dBm)	IRL (dB)	Zin (Ohm)
-12.69	-3.33	$0.64 + j4.04$

X In plots below corresponds to this data.

## VSWR = 2.5 point DATA

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$8.50 + j10.00$	0.72 / 156.75	0.50

Pout (dBm)	Eff (%)	Gt (dB)
37.16	53.59	17.40

AMPM (dBm)	IRL (dB)	Zin (Ohm)
-14.69	-4.54	$0.88 + j4.13$

X In plots below corresponds to this data.

## VSWR = 3 point DATA

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$8.50 + j10.00$	0.72 / 156.75	0.50

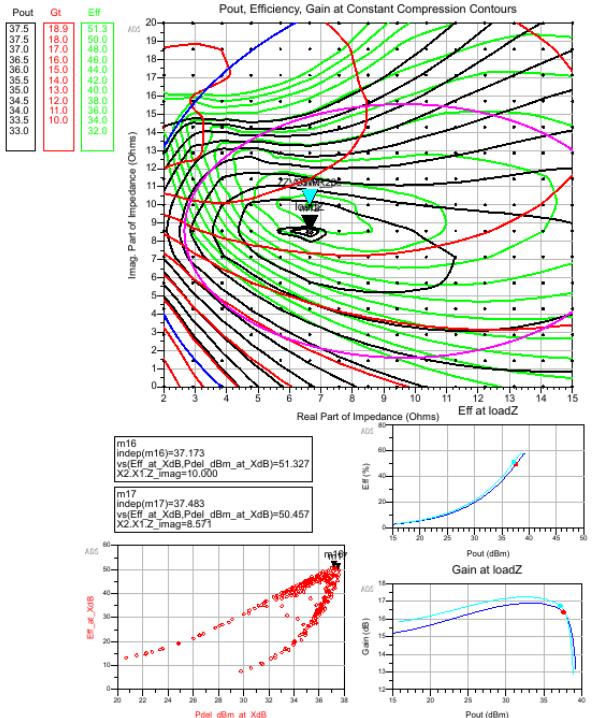
Pout (dBm)	Eff (%)	Gt (dB)
37.16	53.59	17.40

AMPM (dBm)	IRL (dB)	Zin (Ohm)
-14.69	-4.54	$0.88 + j4.13$

X In plots below corresponds to this data.



# Case 0: Moscap 6,23pF (index 6), P1.5dB



## Power Sweep Inspector

VSWRVal=5 VSWRVal=2.5

Move Marker "loadZ" to desired impedance point.

VSWR Locus of Points selector is located on Constant Compression Loadpull page.

VSWR Locus center Impedance =  $6.64 + j8.57$   
VSWR=5

## Summary of Performance at Compression

Marker Impedance  $6.64 + j8.57$  Marker Gamma  $0.77 / 160.21$  Reference Compression Level (dB) 0.50

Pout (dBm) 37.57 Eff (%) 49.85 Gt (dB) 16.39

AMPM (dBm) -14.28 IRL (dB) -2.67 Zin (Ohm)  $0.54 + j4.28$

X In plots below corresponds to this data.

VSWR Locus of Points selector is located on Constant Compression Loadpull page.

VSWR Locus center Impedance =  $6.64 + j8.57$   
VSWR=5

## Summary of Performance at Compression

Marker Impedance  $6.64 + j8.57$  Marker Gamma  $0.77 / 160.21$  Reference Compression Level (dB) 0.50

Pout (dBm) 37.57 Eff (%) 49.85 Gt (dB) 16.39

AMPM (dBm) -14.28 IRL (dB) -2.67 Zin (Ohm)  $0.54 + j4.28$

X In plots below corresponds to this data.

## VSWR = 2.5 point DATA

Marker Impedance  $6.64 + j10.00$  Marker Gamma  $0.77 / 157.00$  Reference Compression Level (dB) 0.50

Pout (dBm) 37.17 Eff (%) 51.33 Gt (dB) 16.73

AMPM (dBm) -17.37 IRL (dB) -3.19 Zin (Ohm)  $0.67 + j4.42$

X In plots below corresponds to this data.

## VSWR = 3 point DATA

Marker Impedance  $6.64 + j10.00$  Marker Gamma  $0.77 / 157.00$  Reference Compression Level (dB) 0.50

Pout (dBm) 37.17 Eff (%) 51.33 Gt (dB) 16.73

AMPM (dBm) -17.37 IRL (dB) -3.19 Zin (Ohm)  $0.67 + j4.42$

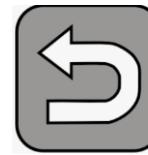
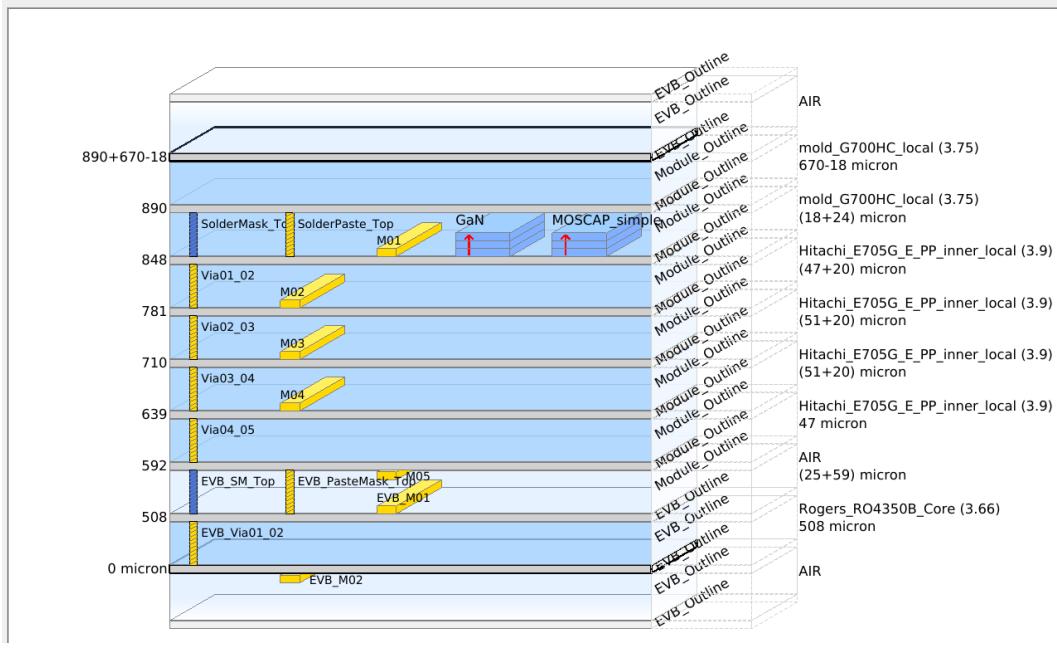
X In plots below corresponds to this data.



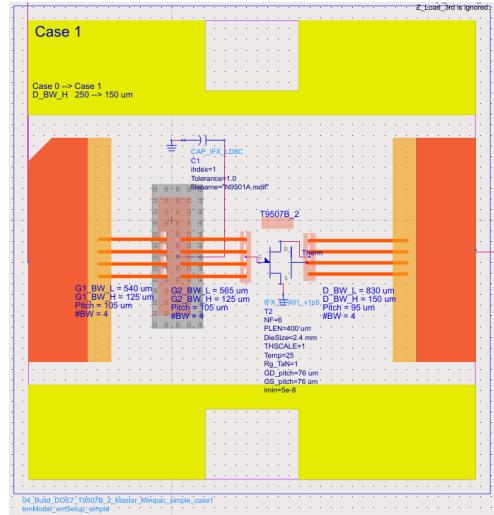
# LP simulations with simple EM model

## Case 1

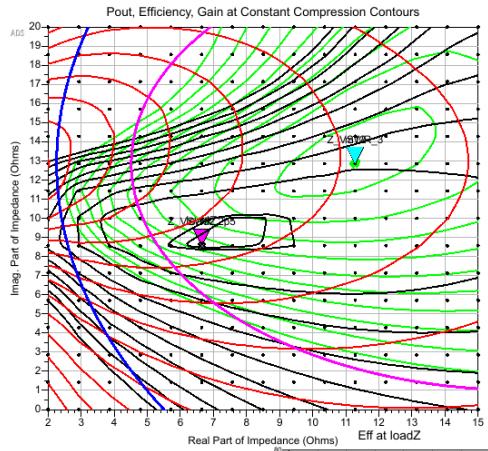
Substrate Name: LAC\_Lam5L\_nest\_simple



# Case 1 : Moscap 1,34 pF (N9501A: index 1), P0.5dB,

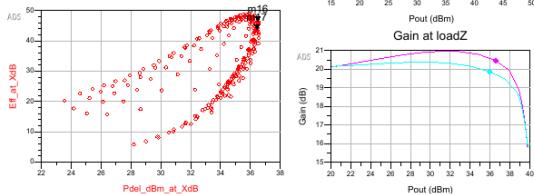


Pout	Gt	Eff
36.5	24.0	49.0
36.5	24.0	48.0
36.5	24.0	47.0
36.5	24.0	46.0
35.0	21.0	42.0
34.5	20.0	40.0
34.5	20.0	38.0
33.5	18.0	36.0
33.5	17.0	34.0
33.0	16.0	32.0
32.5	15.0	30.0
32.0	14.0	28.0



m16  
indep(m16)=36.495  
vs(Eff\_at\_XdB\_PdBm\_at\_XdB)=46.391  
X2:X1\_Z\_imag=10.000

m17  
indep(m17)=36.420  
vs(Eff\_at\_XdB\_PdBm\_at\_XdB)=43.685  
X2:X1\_Z\_imag=8.571



## Power Sweep Inspector

VSWR\_val=5 VSWR\_val=1.25

Move Marker "loadZ" to desired impedance point.

VSWR Locus of Points selector is located on Constant Compression Loadpull page.

VSWR Locus center Impedance =  $6.64 + j8.57$   
VSWR=5

VSWR Locus of Points selector is located on Constant Compression Loadpull page.

VSWR Locus center Impedance =  $11.29 + j12.57$   
VSWR=5

## Summary of Performance at Compression

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$6.64 + j8.57$	0.77 / 160.21	0.50
Pout (dBm)	Eff (%)	Gt (dB)
36.58	40.97	20.46
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-6.27	-1.17	$0.21 + j2.57$

✗ In plots below corresponds to this data.

## Summary of Performance at Compression

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$11.29 + j12.57$	0.65 / 149.78	0.50
Pout (dBm)	Eff (%)	Gt (dB)
35.93	49.03	19.87
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-6.93	-7.68	$1.25 + j3.12$

✗ In plots below corresponds to this data.

## VSWR = 2.5 point DATA

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$6.64 + j8.57$	0.77 / 160.21	0.50
Pout (dBm)	Eff (%)	Gt (dB)
36.58	40.97	20.46
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-6.27	-1.17	$0.21 + j2.57$

✗ In plots below corresponds to this data.

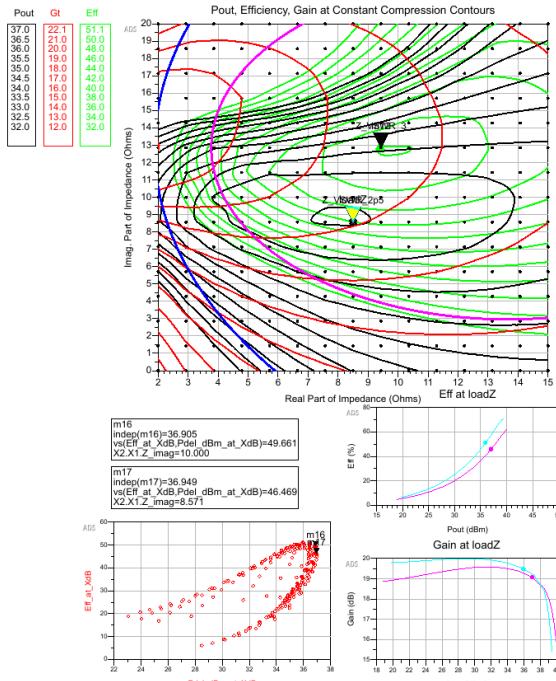
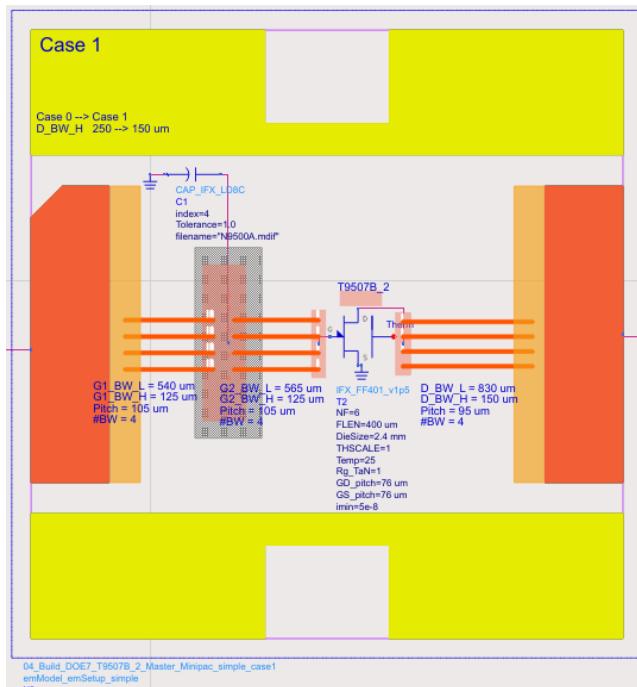
## VSWR = 3 point DATA

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$11.29 + j12.57$	0.65 / 149.78	0.50
Pout (dBm)	Eff (%)	Gt (dB)
35.93	49.03	19.87
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-6.93	-7.68	$1.25 + j3.12$

✗ In plots below corresponds to this data.



# Case 1: Moscap 3,11pF (N9500A\_index 4), P0.5dB



## Power Sweep Inspector

Edt VSWRVal=5 Edt VSWRVal=2.5

Move Marker 'loadZ' to desired impedance point.

VSWR Locus of Points selector is located on Constant Compression Loadpull page.

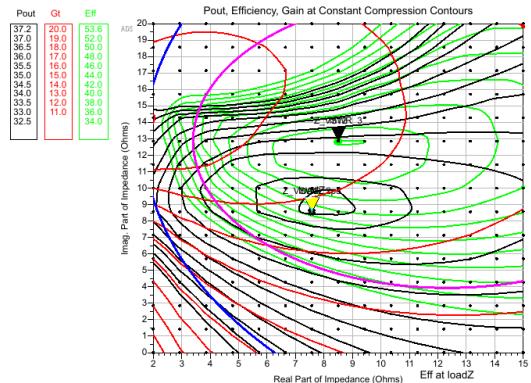
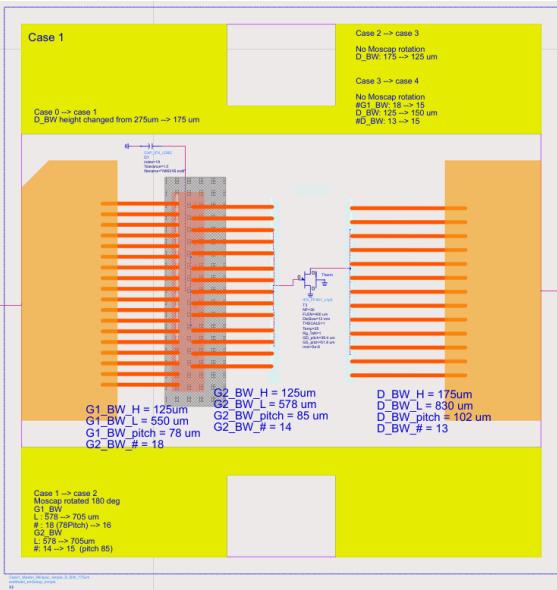
VSWR Locus center Impedance =  $8.50 + [8.57]$   
VSWR=5

VSWR Locus of Points selector is located on Constant Compression Loadpull page.

VSWR Locus center Impedance =  $9.43 + [12.86]$   
VSWR=5



# Case 1: Moscap 4,7pF (index 4), P0.5dB



**Power Sweep Inspector**

Marker VSWRVal=5 Marker VSWRVal=2.5

Marker 'loadZ' to desired impedance point.

VSWR Locus of Points selector is located on Constant Compression Loadpull page.

VSWR Locus center Impedance =  $7.57 + j8.57$   
VSWR=5

VSWR Locus of Points selector is located on Constant Compression Loadpull page.

VSWR Locus center Impedance =  $8.50 + j12.86$   
VSWR=5

## Summary of Performance at Compression

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$7.57 + j8.57$	$0.74 / 160.11$	0.50
Pout (dBm)	Eff (%)	Gt (dB)
37.19	46.91	17.73
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-8.58	-3.01	$0.55 + j3.78$

X In plots below corresponds to this data.

## Summary of Performance at Compression

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$8.50 + j12.86$	$0.73 / 150.39$	0.50
Pout (dBm)	Eff (%)	Gt (dB)
36.19	53.69	18.39
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-12.96	-5.23	$1.04 + j4.25$

X In plots below corresponds to this data.

## VSWR = 2.5 point DATA

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$7.57 + j8.57$	$0.74 / 160.11$	0.50
Pout (dBm)	Eff (%)	Gt (dB)
37.19	46.91	17.73
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-8.58	-3.01	$0.55 + j3.78$

X In plots below corresponds to this data.

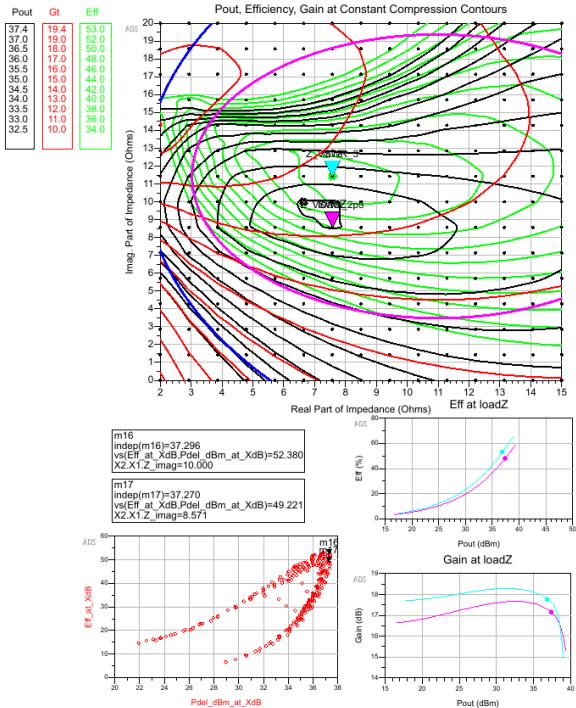
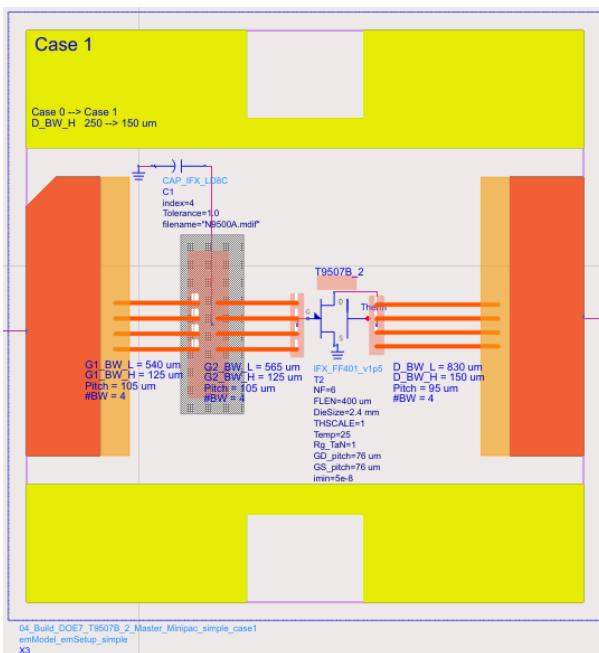
## VSWR = 3 point DATA

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$8.50 + j12.86$	$0.73 / 150.39$	0.50
Pout (dBm)	Eff (%)	Gt (dB)
36.19	53.69	18.39
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-12.96	-5.23	$1.04 + j4.25$

X In plots below corresponds to this data.



# Case 1: Moscap 5,29pF (index N9500A\_index5), P0.5dB



## Power Sweep Inspector

Eqr VSWRVal=5 Eqr VSWRVal=2.5

Marker loadZ to desired impedance point.

VSWR Locus of Points selector is located on Constant Compression Loadpull page.

VSWR Locus center Impedance =  $6.64 + j10.00$   
VSWR=5

## Summary of Performance at Compression

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$7.57 + j8.57$	$0.74 / 160.11$	0.50

Pout (dBm)	Eff (%)	Gt (dB)
37.38	48.06	17.15

AMPM (dBm)	IRL (dB)	Zin (Ohm)
-10.07	-3.11	$0.59 + j3.98$

In plots below corresponds to this data.

## VSWR = 2.5 point DATA

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$7.57 + j8.57$	$0.74 / 160.11$	0.50

Pout (dBm)	Eff (%)	Gt (dB)
37.38	48.06	17.15

AMPM (dBm)	IRL (dB)	Zin (Ohm)
-10.07	-3.11	$0.59 + j3.98$

In plots below corresponds to this data.

## VSWR = 3 point DATA

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$7.57 + j11.43$	$0.75 / 153.70$	0.50

Pout (dBm)	Eff (%)	Gt (dB)
36.82	53.06	17.77

AMPM (dBm)	IRL (dB)	Zin (Ohm)
-14.24	-3.99	$0.81 + j4.30$

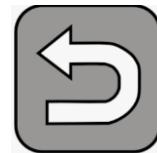
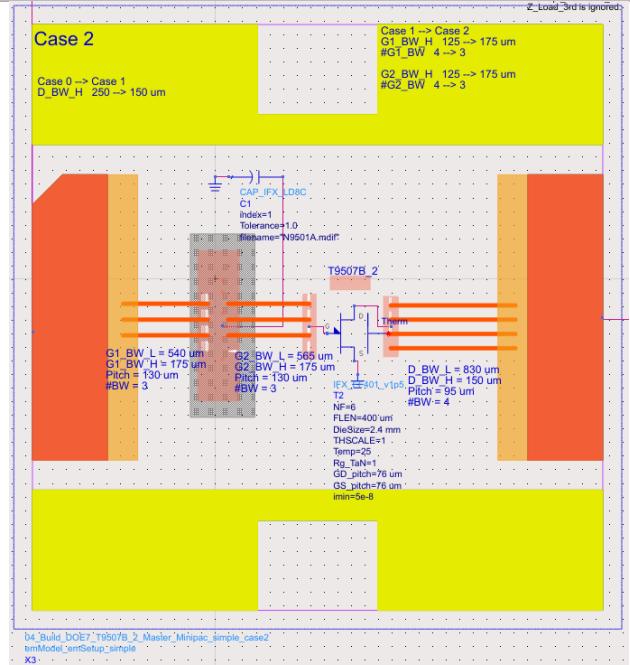
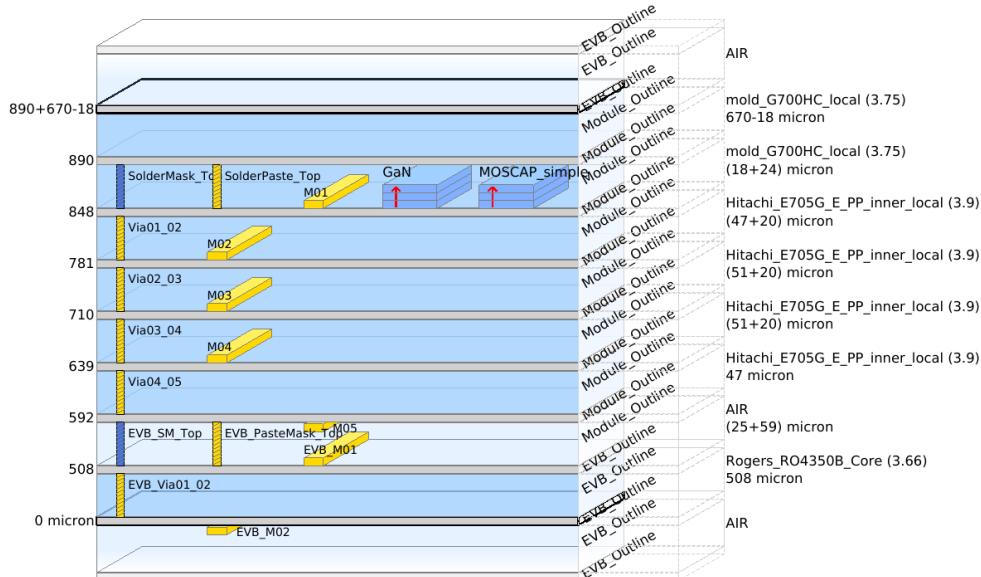
In plots below corresponds to this data.

# LP simulations with simple EM model

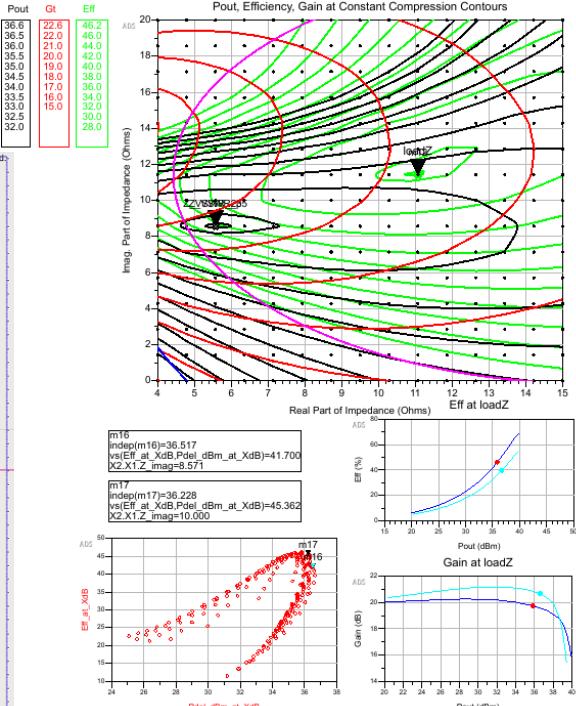
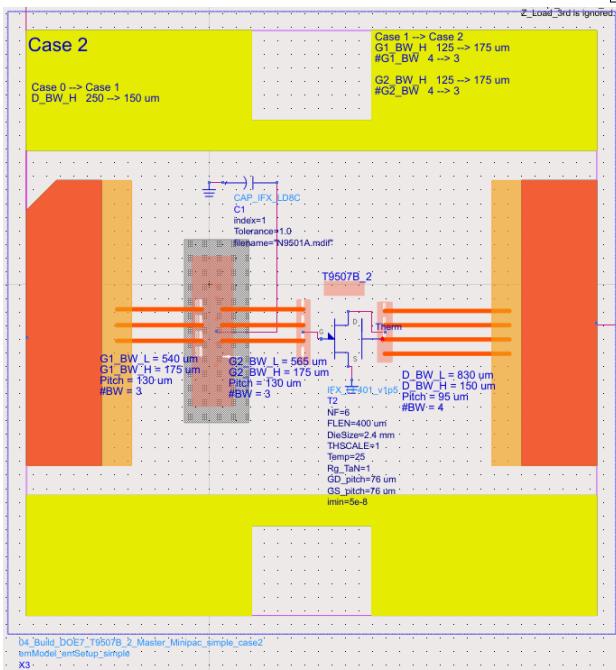
## Case 2



Substrate Name: LAC\_Lam5L\_nest\_simple



# Case 2 : (1,9 pF: N9501A index 1)



## Power Sweep Inspector

Eqn VSWRVal=5 Eqn VSWRVal1=2.5

Move Marker "loadZ" to desired impedance point.

VSWR Locus of Points selector is located on Constant Compression Loadpull page.

VSWR Locus center Impedance =  $5.57 + j6.57$   
VSWR=5

## Summary of Performance at Compression

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$11.07 + j11.43$	$0.65 / 153.04$	0.50
Pout (dBm)	Eff (%)	Gt (dB)
35.84	46.26	19.75
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-7.21	-8.08	$1.32 + j3.30$

X in plots below corresponds to this data.

VSWR Locus of Points selector is located on Constant Compression Loadpull page.

VSWR Locus center Impedance =  $11.07 + j11.43$   
VSWR=5

## Summary of Performance at Compression

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$11.07 + j11.43$	$0.65 / 153.04$	0.50
Pout (dBm)	Eff (%)	Gt (dB)
35.84	46.26	19.75
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-7.21	-8.08	$1.32 + j3.30$

X in plots below corresponds to this data.

## VSWR = 2.5 point DATA

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$5.57 + j8.57$	$0.80 / 160.31$	0.50
Pout (dBm)	Eff (%)	Gt (dB)
36.64	39.69	20.68
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-6.98	-0.40	$0.07 + j2.91$

X in plots below corresponds to this data.

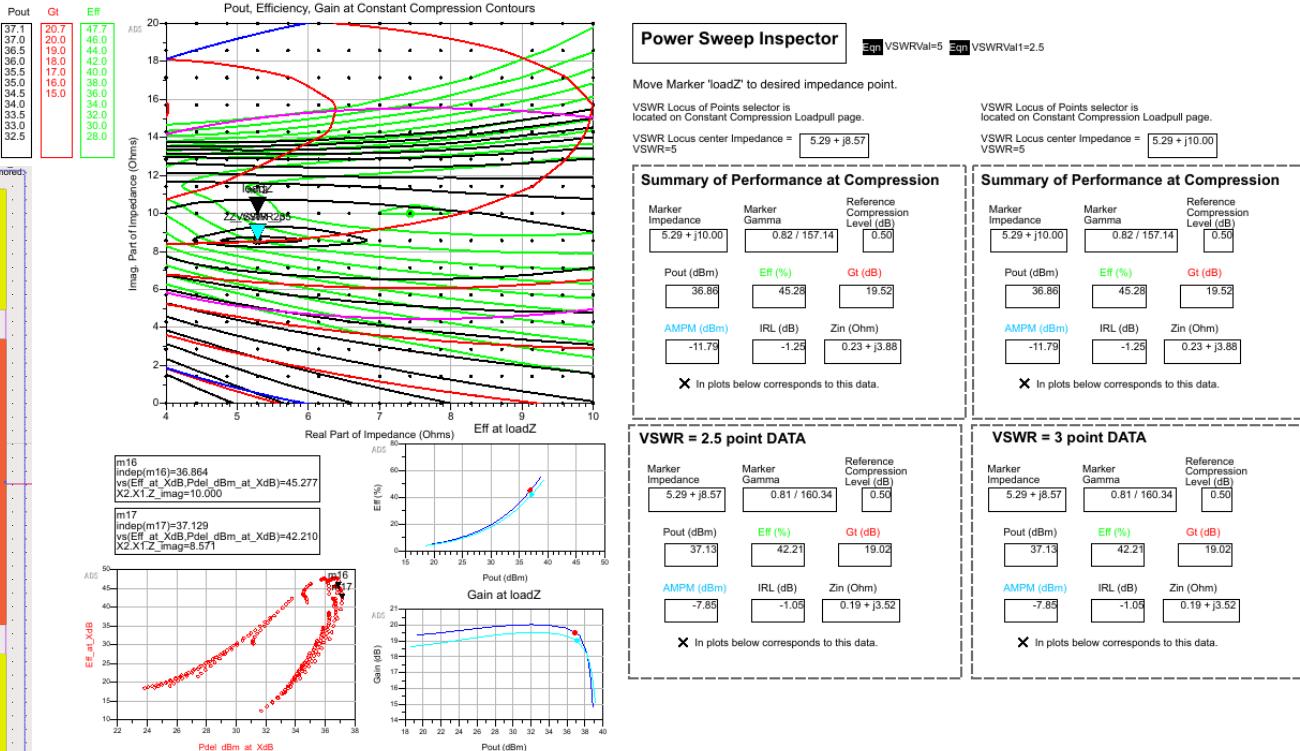
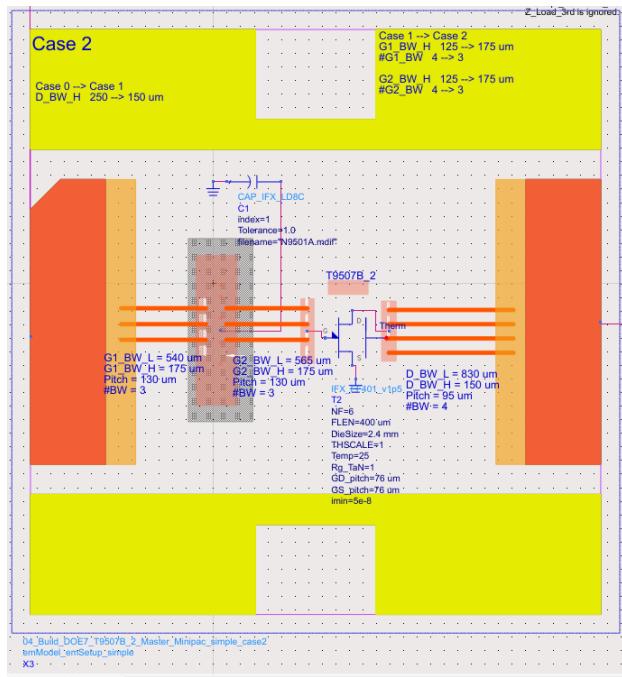
## VSWR = 3 point DATA

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$5.57 + j8.57$	$0.80 / 160.31$	0.50
Pout (dBm)	Eff (%)	Gt (dB)
36.64	39.69	20.68
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-6.98	-0.40	$0.07 + j2.91$

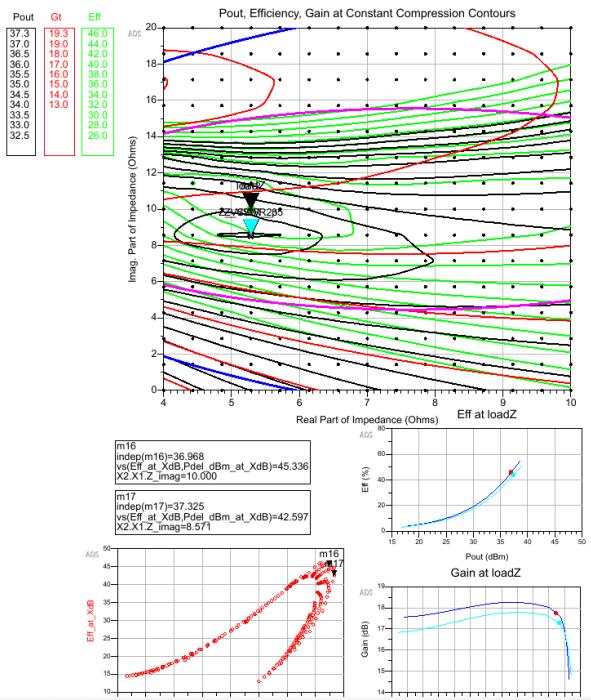
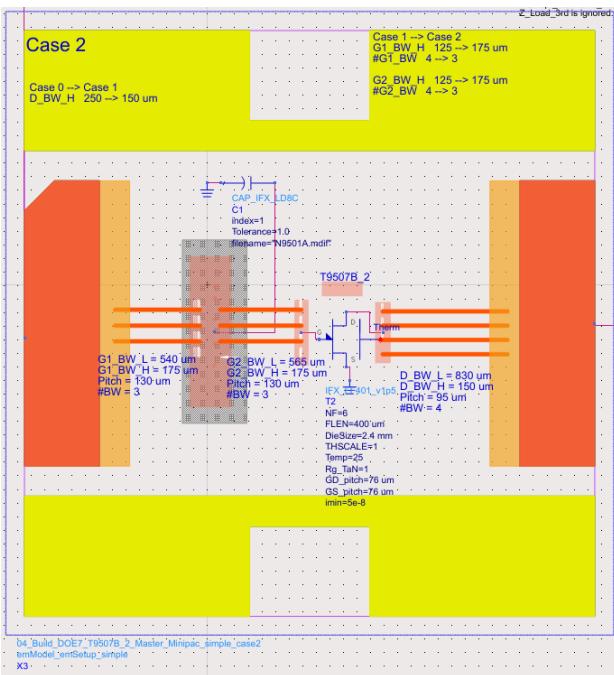
X in plots below corresponds to this data.



# Case 2 : (3,23 pF: N9501A:index 6)



# Case 2 : (4,7 pF: N9501A: index 4)



## Power Sweep Inspector

Eqn VSWRVal=5 Eqn VSWRVal=2.5

Move Marker 'loadZ' to desired impedance point.

VSWR Locus of Points selector is located on Constant Compression Loadpull page.

VSWR Locus center Impedance =  $5.29 + j8.57$

VSWR=5

## Summary of Performance at Compression

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$5.29 + j10.00$	0.82 / 157.14	0.50

Pout (dBm)	Eff (%)	GT (dB)
36.91	46.03	17.75

AMPM (dBm)	IRL (dB)	Zin (Ohm)
-15.52	-2.49	$0.51 + j4.27$

$\times$  In plots below corresponds to this data.

## VSWR = 2.5 point DATA

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$5.29 + j8.57$	0.81 / 160.34	0.50

Pout (dBm)	Eff (%)	GT (dB)
37.34	43.84	17.29

AMPM (dBm)	IRL (dB)	Zin (Ohm)
-11.58	-2.05	$0.39 + j4.00$

$\times$  In plots below corresponds to this data.

VSWR Locus of Points selector is located on Constant Compression Loadpull page.

VSWR Locus center Impedance =  $5.29 + j10.00$

VSWR=5

## Summary of Performance at Compression

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$5.29 + j10.00$	0.82 / 157.14	0.50

Pout (dBm)	Eff (%)	GT (dB)
36.91	46.03	17.75

AMPM (dBm)	IRL (dB)	Zin (Ohm)
-15.52	-2.49	$0.51 + j4.27$

$\times$  In plots below corresponds to this data.

## VSWR = 3 point DATA

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$5.29 + j8.57$	0.81 / 160.34	0.50

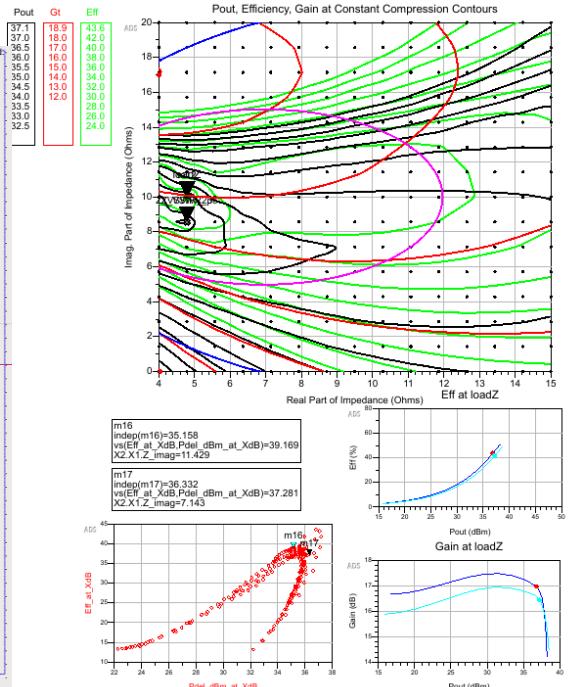
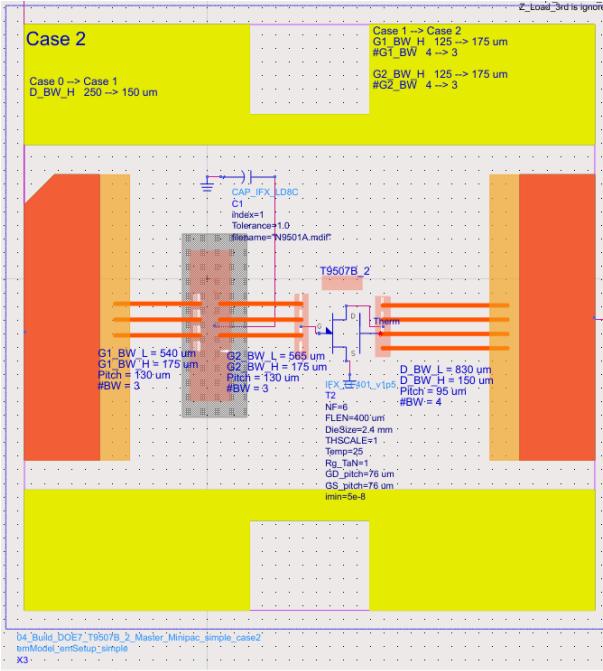
Pout (dBm)	Eff (%)	GT (dB)
37.34	43.84	17.29

AMPM (dBm)	IRL (dB)	Zin (Ohm)
-11.58	-2.05	$0.39 + j4.00$

$\times$  In plots below corresponds to this data.



# Case 2 : (5,27 pF: index 5)



## Power Sweep Inspector

Eqn VSWRVal=5 Eqn VSWRVal=2.5

Move Marker "loadZ" to desired impedance point.

VSWR Locus of Points selector is located on Constant Compression Loadpull page.

VSWR Locus center Impedance = 4.79 + j8.57

## Summary of Performance at Compression

## Summary of Performance at Compression

Marker Impedance: 4.79 + j10.00

Marker Gamma: 0.83 / 157.18

Reference Compression Level (dB): 0.50

Pout (dBm): 36.78

Eff (%) : 43.65

Gt (dB): 16.98

AMPM (dBm): -18.19

IRL (dB): -2.35

Zin (Ohm): 0.49 + j4.41

**X** In plots below corresponds to this data.

## VSWR = 2.5 point DATA

## VSWR = 3 point DATA

Marker Impedance: 4.79 + j8.57

Marker Gamma: 0.83 / 160.37

Reference Compression Level (dB): 0.50

Pout (dBm): 37.18

Eff (%) : 41.82

Gt (dB): 16.44

AMPM (dBm): -13.79

IRL (dB): -1.86

Zin (Ohm): 0.37 + j4.17

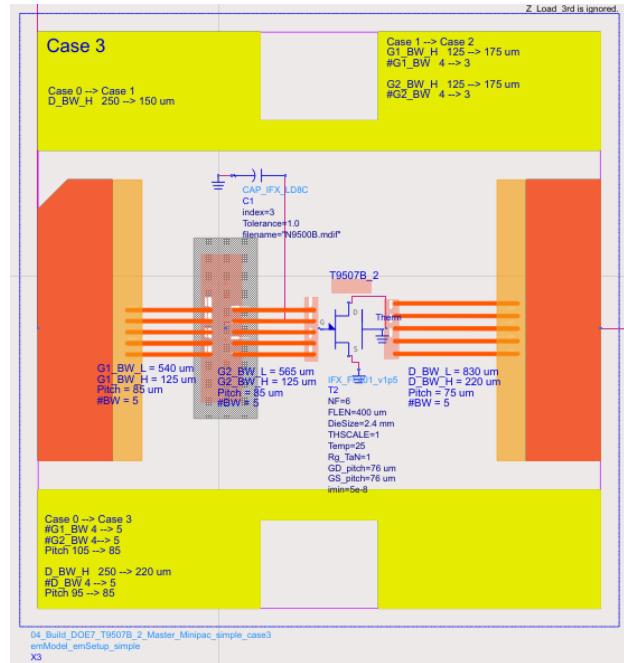
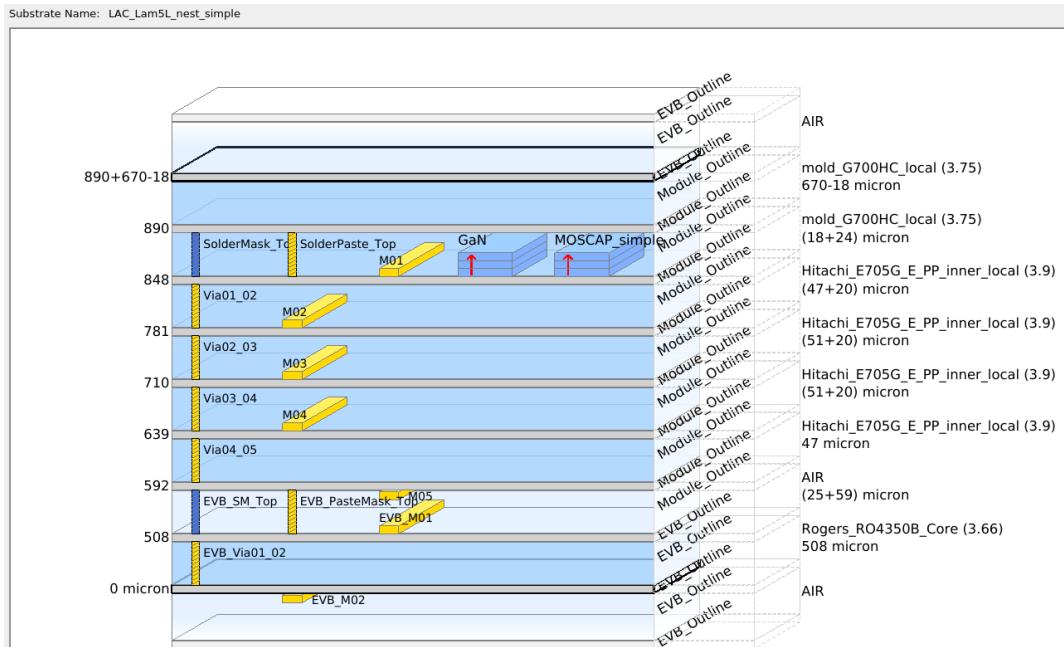
**X** In plots below corresponds to this data.



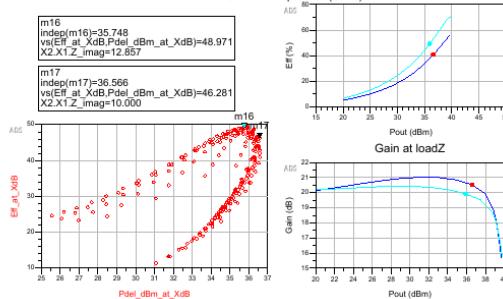
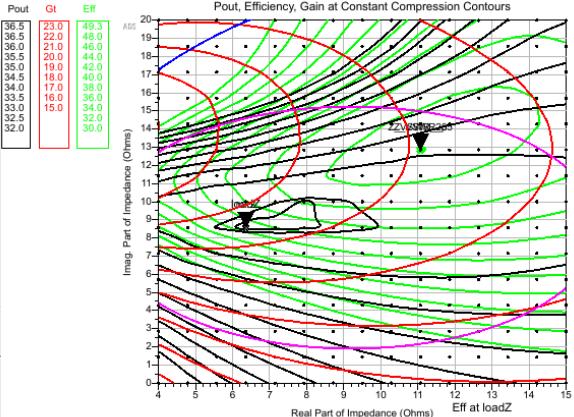
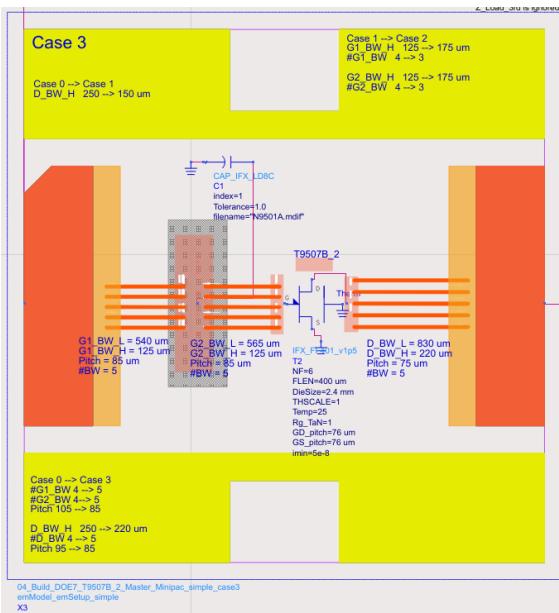
# LP simulations with simple EM model



## Case 3



# Case 3 : (1,93 pF: N9501A index 1)



## Power Sweep Inspector

Eq1 VSWRVal=5 Eq2 VSWRVal1=2.5

Move Marker 'loadZ' to desired impedance point.

VSWR Locus of Points selector is located on Constant Compression Loadpull page.

VSWR Locus center Impedance = 6.36 + j8.57  
VSWR=5

## Summary of Performance at Compression

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
6.36 + j8.57	0.78 / 160.24	0.50
Pout (dBm)	Eff (%)	Gl (dB)
36.58	40.97	20.51
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-6.70	-0.83	0.15 + j2.55

X In plots below corresponds to this data.

## VSWR = 3 point DATA

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
11.07 + j12.86	0.66 / 149.83	0.50
Pout (dBm)	Eff (%)	Gl (dB)
35.92	49.39	19.92
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-7.07	-7.47	1.22 + j3.11

X In plots below corresponds to this data.

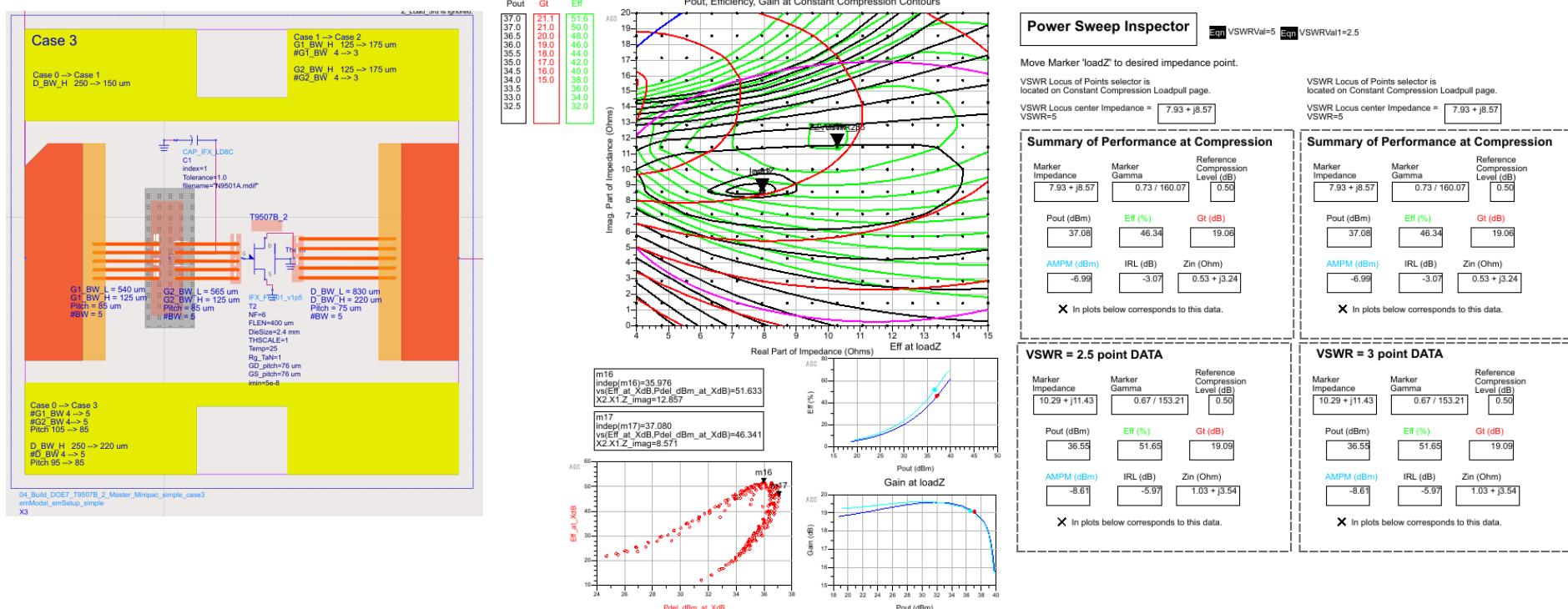
## VSWR = 3 point DATA

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
11.07 + j12.86	0.66 / 149.83	0.50
Pout (dBm)	Eff (%)	Gl (dB)
35.92	49.39	19.92
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-7.07	-7.47	1.22 + j3.11

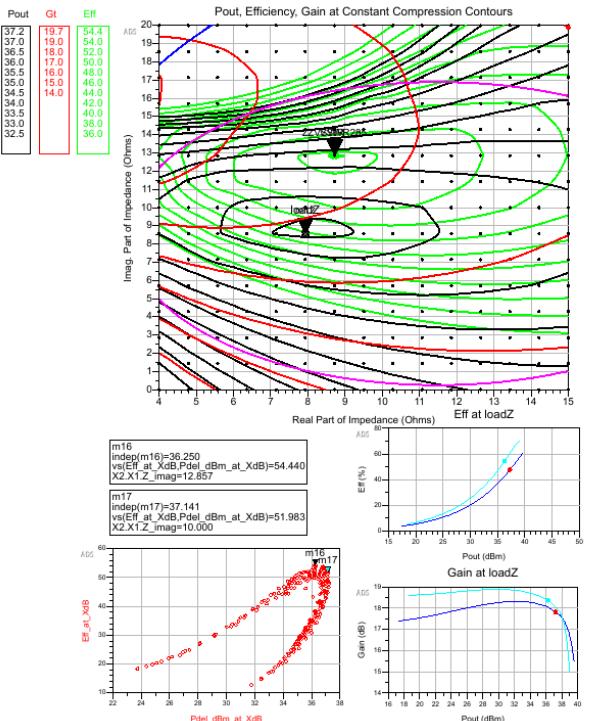
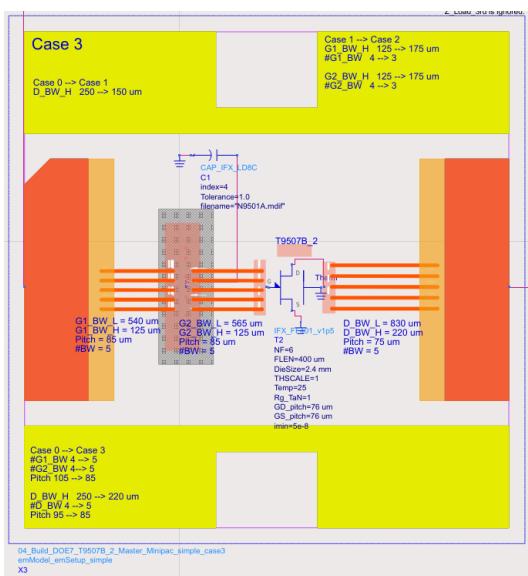
X In plots below corresponds to this data.



# Case 3 : (3,34 pF: N9501A, index 3)



# Case 3 : (4,7 pF: N9501A, index 4)



## Power Sweep Inspector

Eqn VSWRVal=5 Eqn VSWRVal=2.5

Move Marker 'loadZ' to desired impedance point.

VSWR Locus of Points selector is located on Constant Compression Loadpull page.

VSWR Locus center Impedance = 7.93 + j8.57  
VSWR=5

## Summary of Performance at Compression

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
7.93 + j8.57	0.73 / 160.07	0.50

Pout (dBm) : 37.21

Eff (%) : 47.81

Gt (dB) : 17.81

AMPM (dBm) : -8.65

IRL (dB) : -3.28

Zin (Ohm) : 0.59 + j3.76

X in plots below corresponds to this data.

VSWR Locus of Points selector is located on Constant Compression Loadpull page.

VSWR Locus center Impedance = 7.93 + j8.57  
VSWR=5

## Summary of Performance at Compression

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
7.93 + j8.57	0.73 / 160.07	0.50

Pout (dBm) : 37.21

Eff (%) : 47.81

Gt (dB) : 17.81

AMPM (dBm) : -8.65

IRL (dB) : -3.28

Zin (Ohm) : 0.59 + j3.76

X in plots below corresponds to this data.

## VSWR = 2.5 point DATA

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
8.71 + j12.86	0.72 / 150.35	0.50

Pout (dBm) : 36.25

Eff (%) : 54.44

Gt (dB) : 18.38

AMPM (dBm) : -12.61

IRL (dB) : -5.32

Zin (Ohm) : 1.05 + j4.21

X in plots below corresponds to this data.

## VSWR = 3 point DATA

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
8.71 + j12.86	0.72 / 150.35	0.50

Pout (dBm) : 36.25

Eff (%) : 54.44

Gt (dB) : 18.38

AMPM (dBm) : -12.61

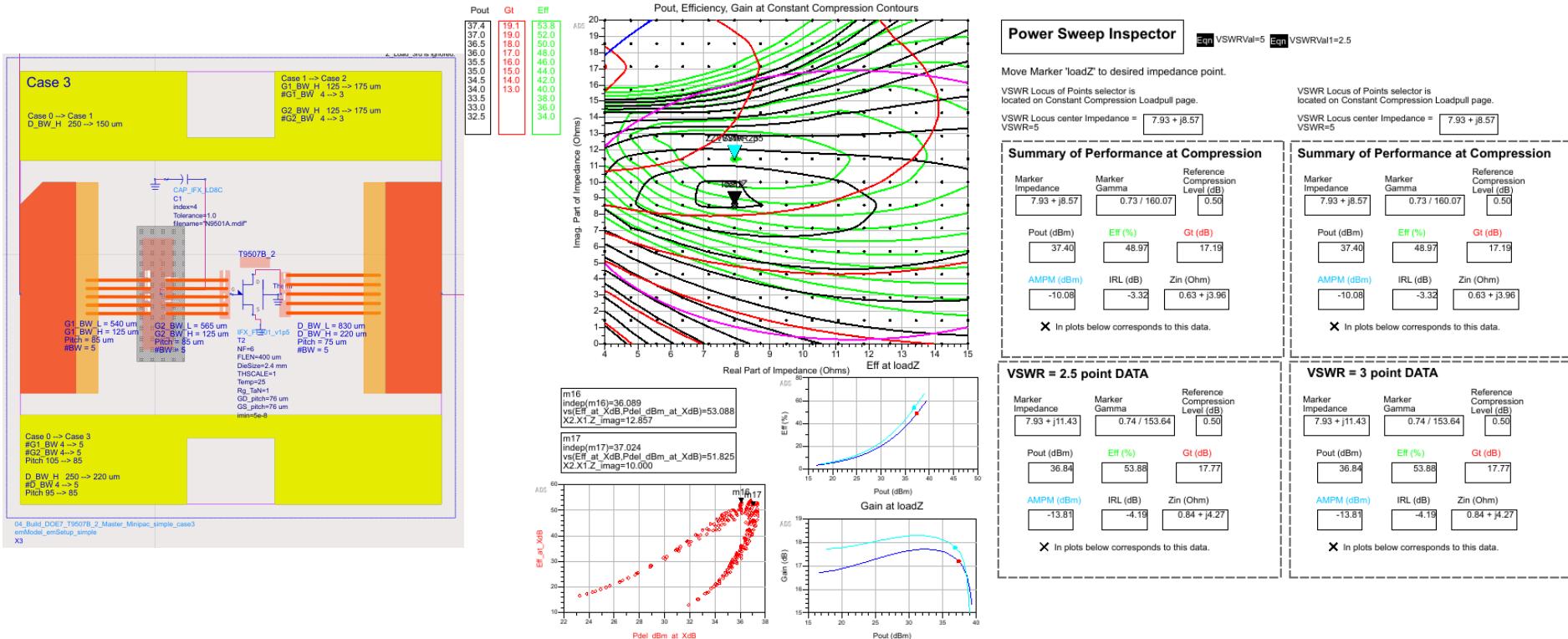
IRL (dB) : -5.32

Zin (Ohm) : 1.05 + j4.21

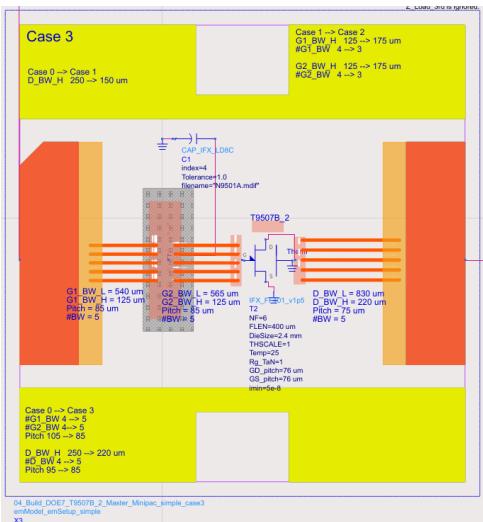
X in plots below corresponds to this data.



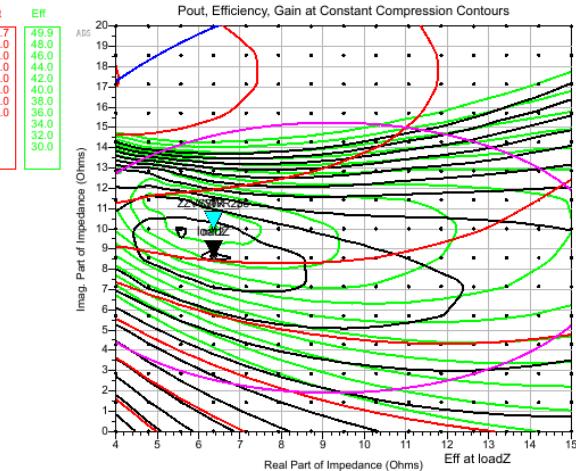
# Case 3 : Moscap rotate 0 deg (5,29 pF: N9500B index 5)



# Case 3 : Moscap rotate 0 deg (6.59 pF: N9500B index 3)

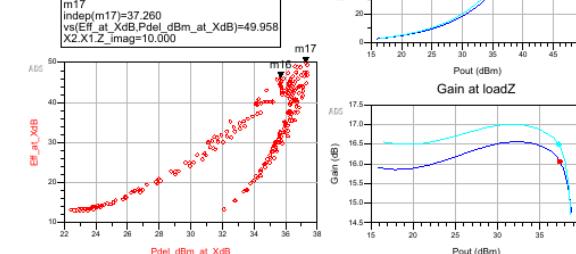


Pout    Gt    Eff



m16  
indep(m16)=35.683  
vs(Eff\_at\_XdB\_Pdel\_dBm\_at\_XdB)=46.132  
X2\_X1\_Z\_imag=12.857

m17  
indep(m17)=37.269  
vs(Eff\_at\_XdB\_Pdel\_dBm\_at\_XdB)=49.958  
X2\_X1\_Z\_imag=10.000



## Power Sweep Inspector

En VSWRVal=5 Eqr VSWRVal=2.5

Move Marker 'loadZ' to desired impedance point.

VSWR Locus of Points selector is located on Constant Compression Loadpull page.

VSWR Locus center Impedance =  $6.36 + j8.57$   
VSWR=5

VSWR Locus of Points selector is located on Constant Compression Loadpull page.

VSWR Locus center Impedance =  $6.36 + j8.57$   
VSWR=5

## Summary of Performance at Compression

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$6.36 + j8.57$	$0.78 / 160.24$	0.50
Pout (dBm)	Eff (%)	Gt (dB)
37.38	46.72	16.06
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-12.07	-2.26	$0.47 + j4.33$

✗ In plots below corresponds to this data.

## Summary of Performance at Compression

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$6.36 + j8.57$	$0.78 / 160.24$	0.50
Pout (dBm)	Eff (%)	Gt (dB)
37.38	46.72	16.06
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-12.07	-2.26	$0.47 + j4.33$

✗ In plots below corresponds to this data.

## VSWR = 2.5 point DATA

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$6.36 + j10.00$	$0.78 / 157.03$	0.50
Pout (dBm)	Eff (%)	Gt (dB)
37.26	49.96	16.50
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-15.01	-2.63	$0.56 + j4.48$

✗ In plots below corresponds to this data.

## VSWR = 3 point DATA

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$6.36 + j10.00$	$0.78 / 157.03$	0.50
Pout (dBm)	Eff (%)	Gt (dB)
37.26	49.96	16.50
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-15.01	-2.63	$0.56 + j4.48$

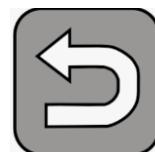
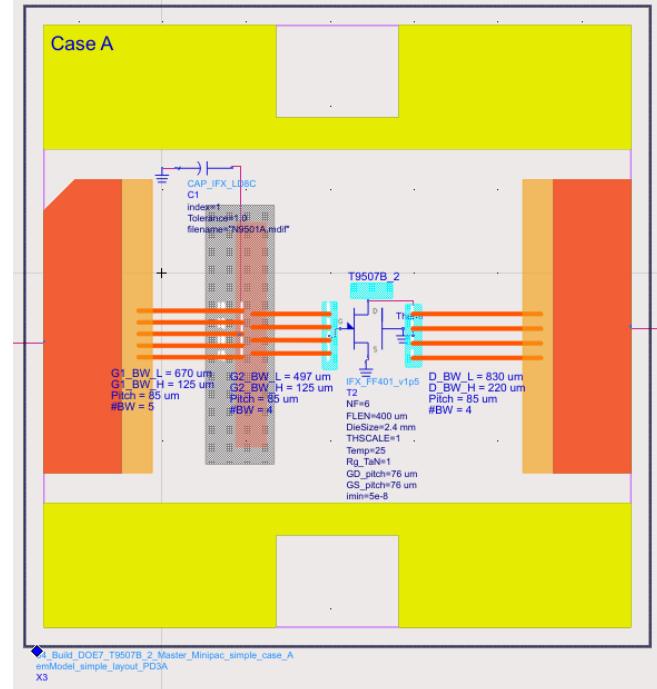
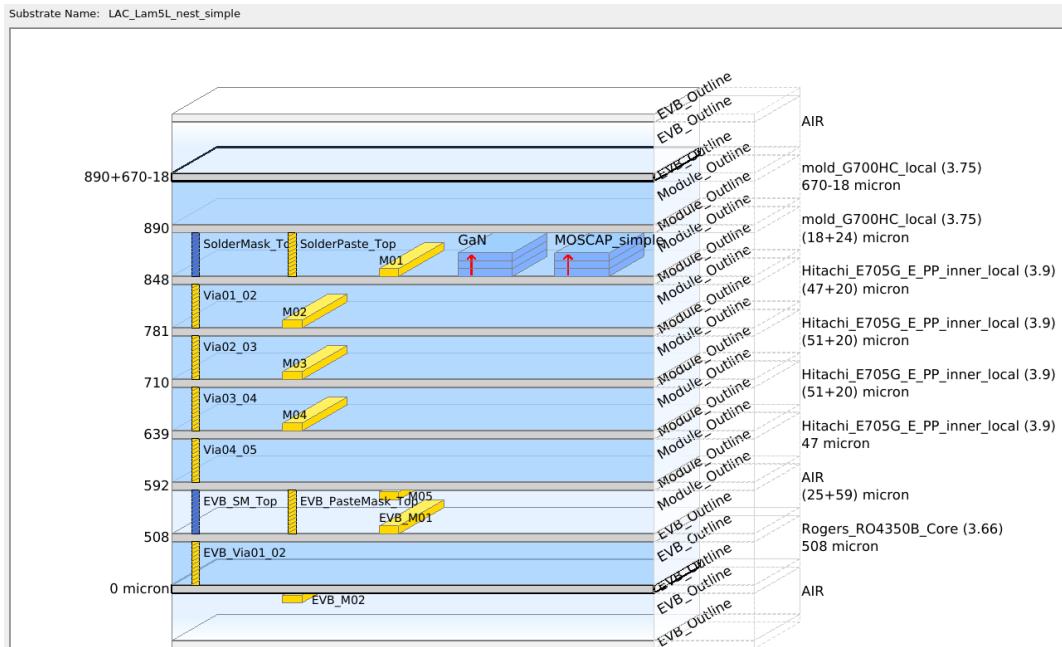
✗ In plots below corresponds to this data.



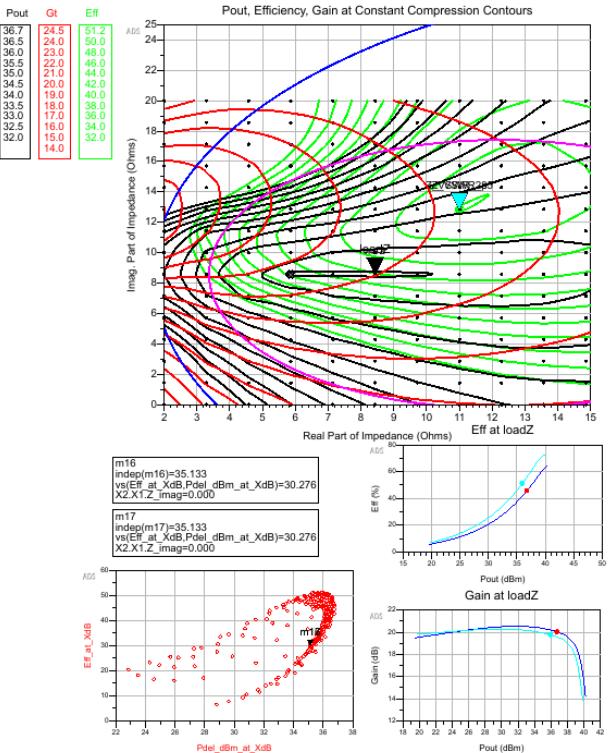
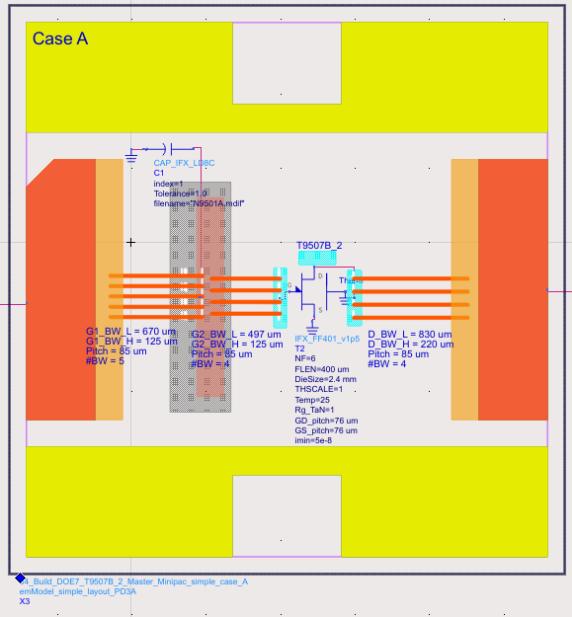
# LP simulations with simple EM model



## Case A



# Case A : (1,93 pF: N9501A index 1)



## Power Sweep Inspector

Eqn VSWRVal=5 Eqn VSWRVal=1.2.5

Move Marker "loadZ" to desired impedance point.

VSWR Locus of Points selector is located on Constant Compression Loadpull page.  
VSWR Locus center Impedance =  $5.86 + j8.57$   
VSWR=5

## Summary of Performance at Compression

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$8.43 + j8.57$	0.72 / 160.00	0.50

Pout (dBm)	Eff (%)	Gt (dB)
36.73	45.92	20.03

AMPM (dBm)	IRL (dB)	Zin (Ohm)
-9.98	-3.30	$0.57 + j2.61$

X In plots below corresponds to this data.

VSWR Locus of Points selector is located on Constant Compression Loadpull page.  
VSWR Locus center Impedance =  $8.43 + j8.57$   
VSWR=5

## Summary of Performance at Compression

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$8.43 + j8.57$	0.72 / 160.00	0.50

Pout (dBm)	Eff (%)	Gt (dB)
36.73	45.92	20.03

AMPM (dBm)	IRL (dB)	Zin (Ohm)
-9.98	-3.30	$0.57 + j2.61$

X In plots below corresponds to this data.

## VSWR = 2.5 point DATA

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$11.00 + j12.86$	0.66 / 149.85	0.50

Pout (dBm)	Eff (%)	Gt (dB)
35.92	51.21	19.78

AMPM (dBm)	IRL (dB)	Zin (Ohm)
-10.45	-7.82	$1.27 + j3.12$

X In plots below corresponds to this data.

## VSWR = 3 point DATA

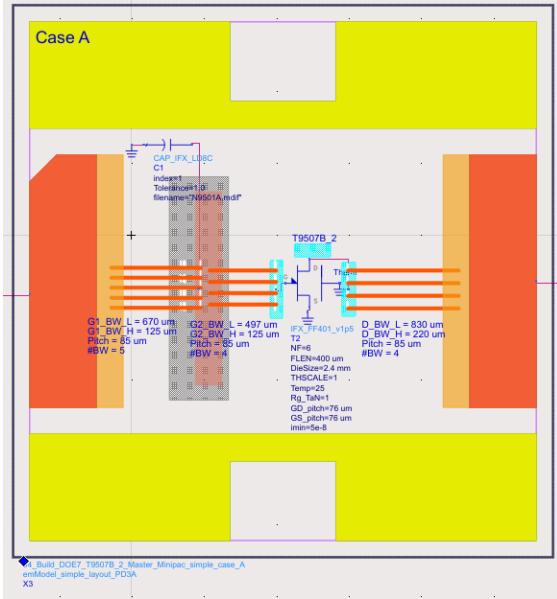
Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$11.00 + j12.86$	0.66 / 149.85	0.50

Pout (dBm)	Eff (%)	Gt (dB)
35.92	51.21	19.78

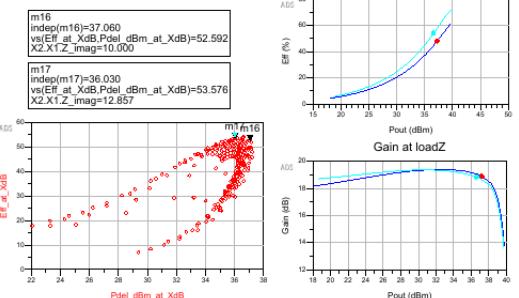
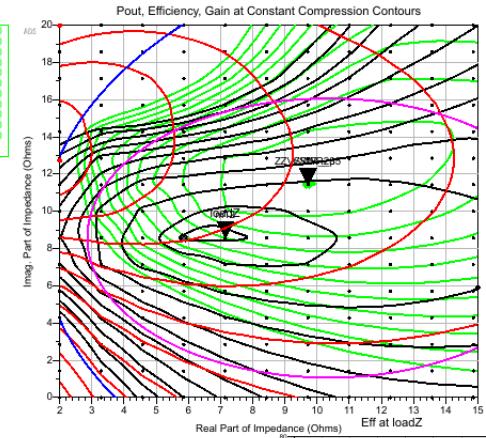
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-10.45	-7.82	$1.27 + j3.12$

X In plots below corresponds to this data.

# Case A : (3,53 pF: N9501B index 16)



Pout	Gt	Eff
37.2	21.5	54.0
37.0	21.0	52.0
36.5	20.0	48.0
36.0	19.0	48.0
35.5	18.0	44.0
35.0	17.0	42.0
34.5	16.0	42.0
34.0	15.0	40.0
33.5	14.0	39.0
33.0	13.0	36.0
32.5	12.0	34.0



## Power Sweep Inspector

Eqn VSWRVal=5 Eqn VSWRVal=2.5

Move Marker 'loadZ' to desired impedance point.

VSWR Locus of Points selector is located on Constant Compression Loadpull page.

VSWR Locus center Impedance =  $5.86 + j8.57$   
VSWR=5

VSWR Locus of Points selector is located on Constant Compression Loadpull page.

VSWR Locus center Impedance =  $7.14 + j8.57$   
VSWR=5

## Summary of Performance at Compression

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
7.14 + j8.57	0.76 / 160.16	0.50
Pout (dBm)	Eff (%)	GI (dB)
37.20	48.05	18.88
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-11.06	-2.66	$0.46 + j3.40$

X In plots below corresponds to this data.

## Summary of Performance at Compression

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
7.14 + j8.57	0.76 / 160.16	0.50
Pout (dBm)	Eff (%)	GI (dB)
37.20	48.05	18.88
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-11.06	-2.66	$0.46 + j3.40$

X In plots below corresponds to this data.

## VSWR = 2.5 point DATA

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
9.71 + j11.43	0.69 / 153.33	0.50
Pout (dBm)	Eff (%)	GI (dB)
36.59	54.06	18.84
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-12.79	-6.20	$1.08 + j3.65$

X In plots below corresponds to this data.

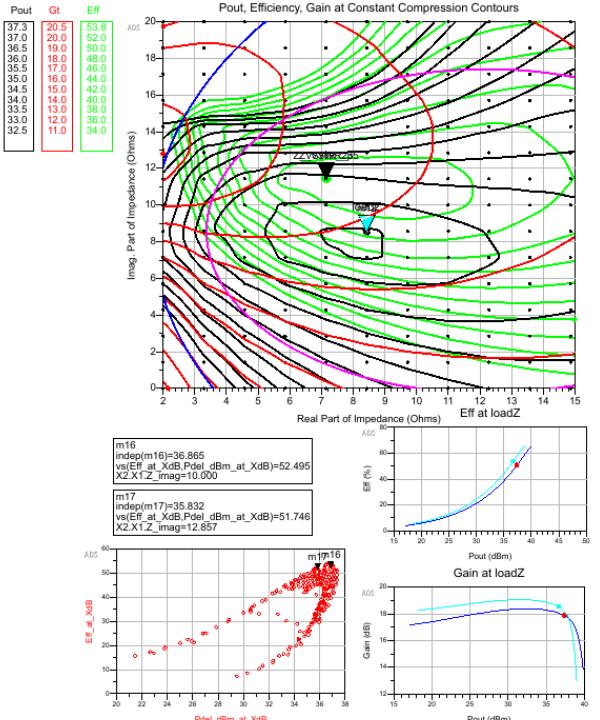
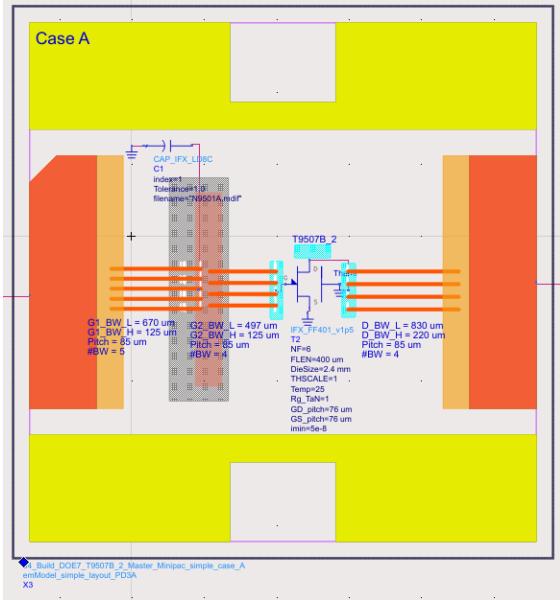
## VSWR = 3 point DATA

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
9.71 + j11.43	0.69 / 153.33	0.50
Pout (dBm)	Eff (%)	GI (dB)
36.59	54.06	18.84
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-12.79	-6.20	$1.08 + j3.65$

X In plots below corresponds to this data.



# Case A : (4,46 pF: N9501B\_V4 index 12)



## Power Sweep Inspector

Eqn VSWRVal=5 Eqn VSWRVal=2.5

Move Marker 'loadZ' to desired impedance point.

VSWR Locus of Points selector is located on Constant Compression Loadpull page.

VSWR Locus center Impedance = 8.43 + j8.57

## Summary of Performance at Compression

VSWR Locus of Points selector is located on Constant Compression Loadpull page.

VSWR Locus center Impedance = 8.43 + j8.57

## Summary of Performance at Compression

Marker Impedance: 8.43 + j8.57

Marker Gamma: 0.72 / 160.00

Reference Compression Level (dB): 0.50

Pout (dBm): 37.33

Eff (%) : 50.82

Gt (dB): 17.87

AMPM (dBm): -12.07

IRL (dB): -4.17

Zin (Ohm): 0.74 + j3.66

X In plots below corresponds to this data.

X In plots below corresponds to this data.

## VSWR = 2.5 point DATA

X In plots below corresponds to this data.

Marker Impedance: 7.14 + j11.43

Marker Gamma: 0.76 / 153.76

Reference Compression Level (dB): 0.50

Pout (dBm): 36.65

Eff (%) : 53.90

Gt (dB): 18.54

AMPM (dBm): -16.34

IRL (dB): -4.09

Zin (Ohm): 0.79 + j4.11

X In plots below corresponds to this data.

X In plots below corresponds to this data.

## VSWR = 3 point DATA

X In plots below corresponds to this data.

Marker Impedance: 7.14 + j11.43

Marker Gamma: 0.76 / 153.76

Reference Compression Level (dB): 0.50

Pout (dBm): 36.65

Eff (%) : 53.90

Gt (dB): 18.54

AMPM (dBm): -16.34

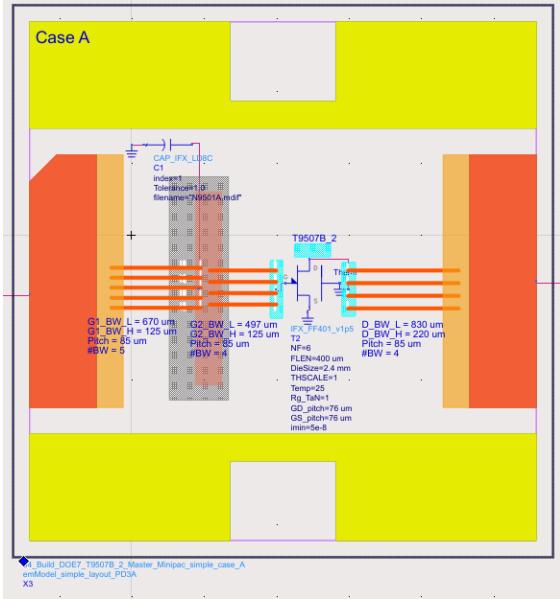
IRL (dB): -4.09

Zin (Ohm): 0.79 + j4.11

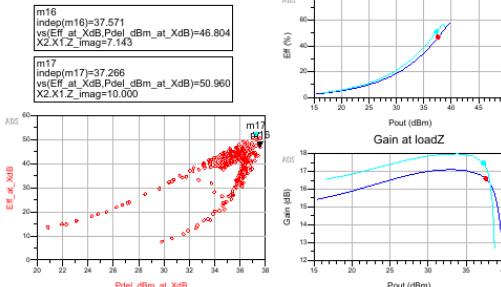
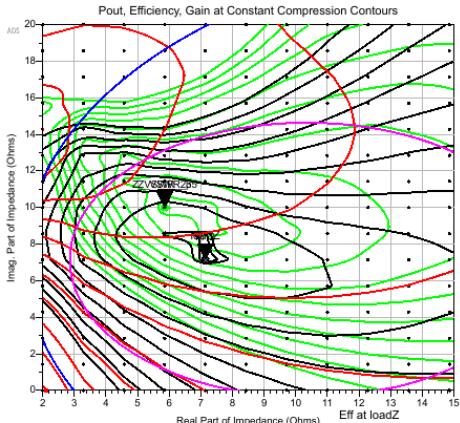
X In plots below corresponds to this data.

X In plots below corresponds to this data.

# Case A : (5,52 pF: N9501B index 10)



Pout	Gt	Eff
37.5	10.7	50.9
37.0	10.0	50.0
36.5	18.0	48.0
36.0	17.0	46.0
35.5	16.0	44.0
35.0	15.0	42.0
34.5	14.0	40.0
34.0	13.0	38.0
33.5	11.0	34.0
33.0	10.0	32.0



## Power Sweep Inspector

Eqr VSWRVal=5 Eqr VSWRVal1=2.5

Move Marker loadZ to desired impedance point.

VSWR Locus of Points selector is located on Constant Compression Loadpull page.

VSWR Locus center Impedance =  $7.14 + j7.14$   
VSWR=5

VSWR Locus of Points selector is located on Constant Compression Loadpull page.

VSWR Locus center Impedance =  $7.14 + j7.14$   
VSWR=5

## Summary of Performance at Compression

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$7.14 + j7.14$	0.75 / 163.41	0.50
Pout (dBm)	Eff (%)	Gt (dB)
37.5	46.80	16.60
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-11.40	-2.91	$0.53 + j3.81$

X In plots below corresponds to this data.

## Summary of Performance at Compression

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$7.14 + j7.14$	0.75 / 163.41	0.50
Pout (dBm)	Eff (%)	Gt (dB)
37.5	46.80	16.60
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-11.40	-2.91	$0.53 + j3.81$

X In plots below corresponds to this data.

## VSWR = 2.5 point DATA

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$5.86 + j10.00$	0.80 / 157.09	0.50
Pout (dBm)	Eff (%)	Gt (dB)
37.27	50.96	17.47
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-16.82	-2.40	$0.48 + j4.23$

X In plots below corresponds to this data.

## VSWR = 3 point DATA

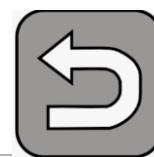
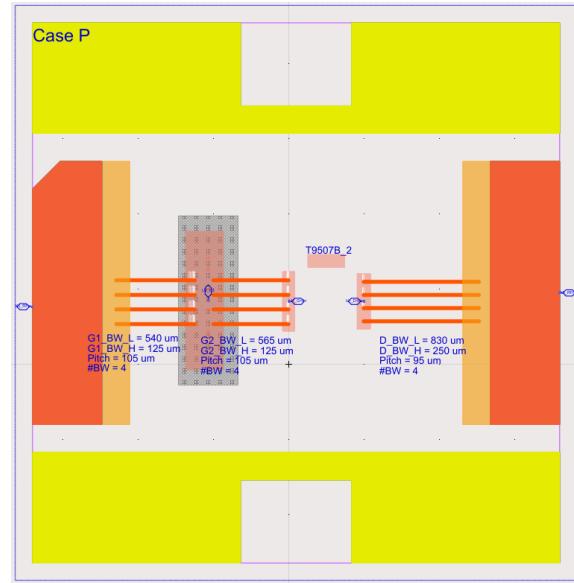
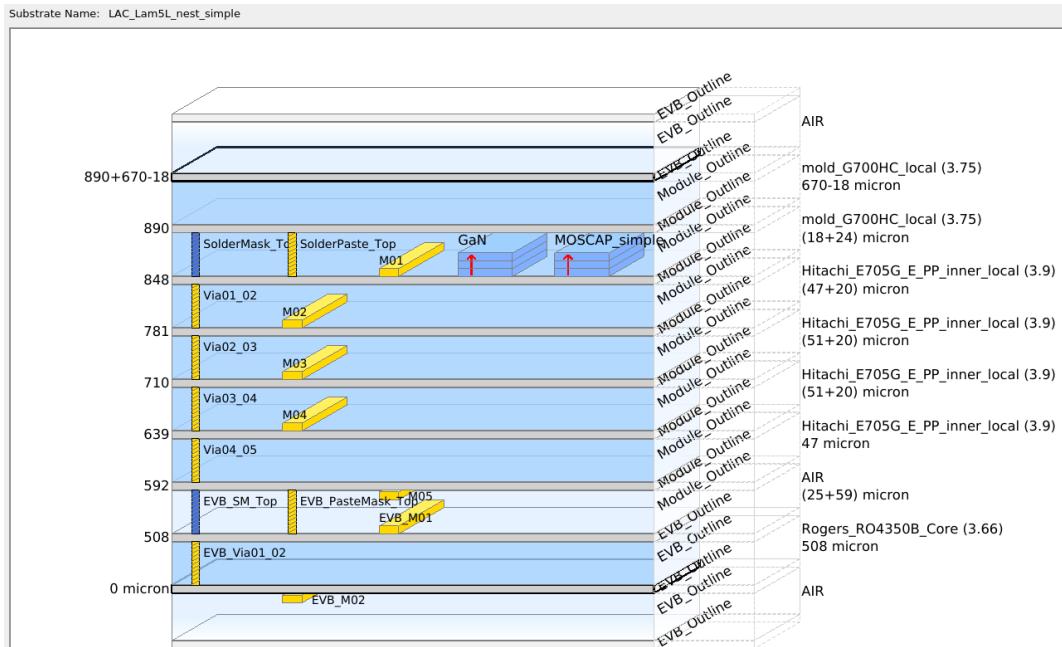
Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$5.86 + j10.00$	0.80 / 157.09	0.50
Pout (dBm)	Eff (%)	Gt (dB)
37.27	50.96	17.47
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-16.82	-2.40	$0.48 + j4.23$

X In plots below corresponds to this data.

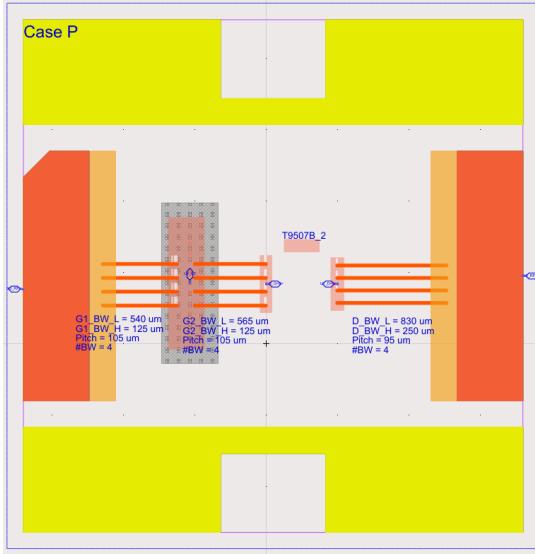
# LP simulations with simple EM model

## Case P

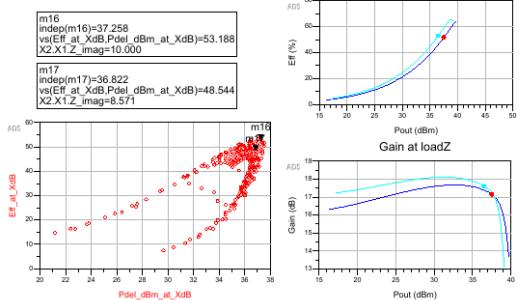
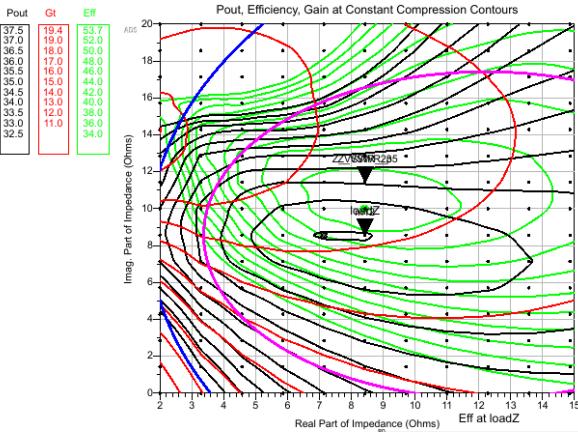
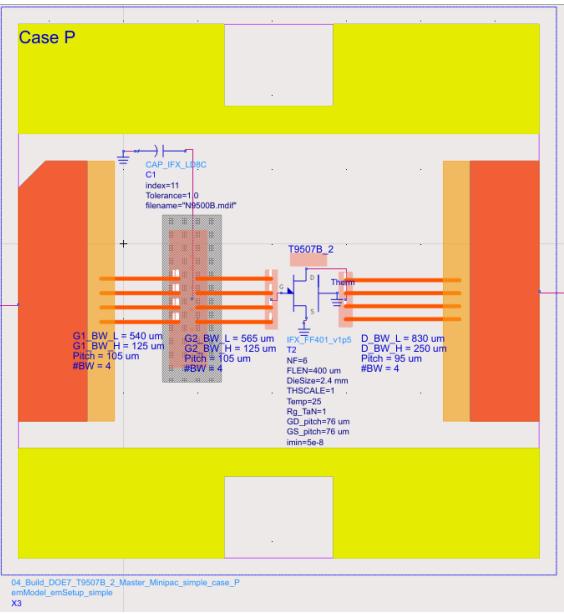
Substrate Name: LAC\_Lam5L\_nest\_simple



# Case P : (4,64 pF: N9500B index 1)



# Case P : (5,52 pF: N9500B index 11)



## Power Sweep Inspector

Move Marker "load2" to desired impedance point.

VSWR Locus of Points selector is located on Constant Compression Loadpull page.

VSWR Locus center Impedance =  $7.14 + j8.57$

## Summary of Performance at Compression

Marker Impedance:  $8.43 + j8.57$ , Marker Gamma:  $0.72 / 160.00$ , Reference Compression Level (dB): 0.50

Pout (dBm): 37.49, Eff (%): 51.75, Gt (dB): 17.16

AMPM (dBm): -12.68, IRL (dB): -3.96, Zin (Ohm):  $0.75 + j4.00$

X in plots below corresponds to this data.

VSWR Locus of Points selector is located on Constant Compression Loadpull page.  
VSWR Locus center Impedance =  $8.43 + j8.57$   
VSWR=5

## Summary of Performance at Compression

Marker Impedance:  $8.43 + j8.57$ , Marker Gamma:  $0.72 / 160.00$ , Reference Compression Level (dB): 0.50

Pout (dBm): 37.49, Eff (%): 51.75, Gt (dB): 17.16

AMPM (dBm): -12.68, IRL (dB): -3.96, Zin (Ohm):  $0.75 + j4.00$

X in plots below corresponds to this data.

## VSWR = 2.5 point DATA

Marker Impedance:  $8.43 + j11.43$ , Marker Gamma:  $0.72 / 153.56$ , Reference Compression Level (dB): 0.50

Pout (dBm): 36.45, Eff (%): 52.94, Gt (dB): 17.60

AMPM (dBm): -15.87, IRL (dB): -5.02, Zin (Ohm):  $1.00 + j4.24$

X in plots below corresponds to this data.

## VSWR = 3 point DATA

Marker Impedance:  $8.43 + j11.43$ , Marker Gamma:  $0.72 / 153.56$ , Reference Compression Level (dB): 0.50

Pout (dBm): 36.45, Eff (%): 52.94, Gt (dB): 17.60

AMPM (dBm): -15.87, IRL (dB): -5.02, Zin (Ohm):  $1.00 + j4.24$

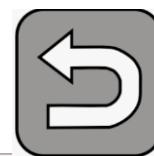
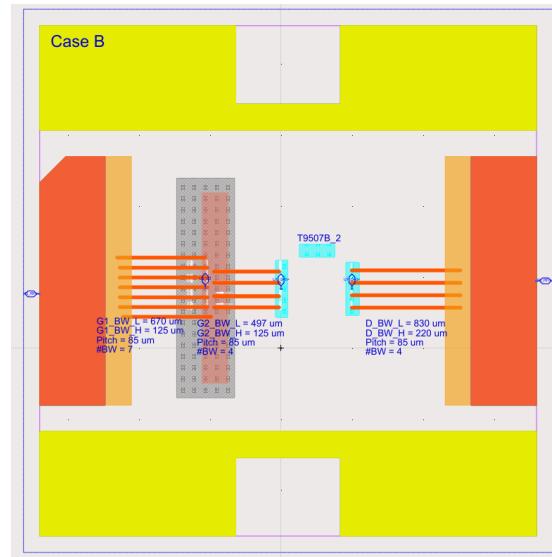
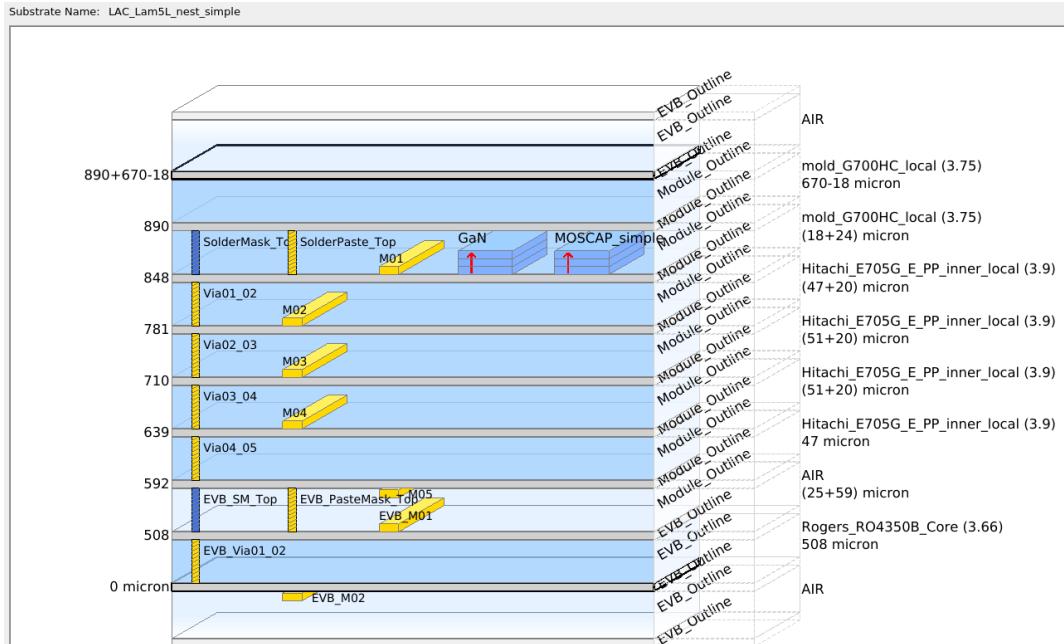
X in plots below corresponds to this data.



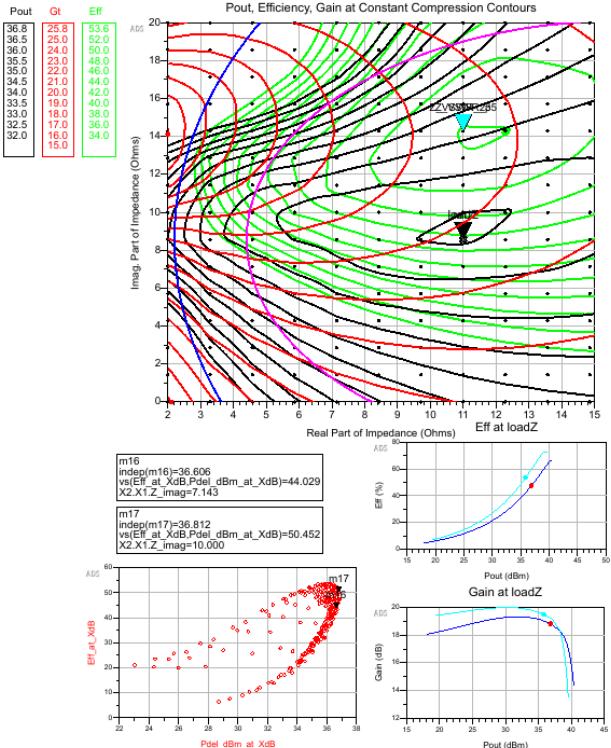
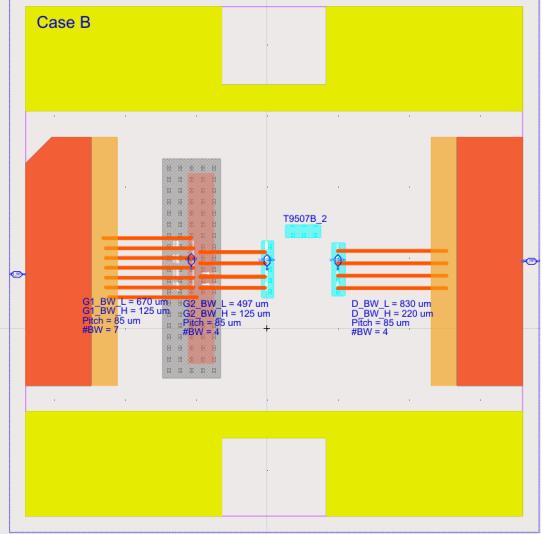
# LP simulations with simple EM model



## Case B



# Case B : (1,93 pF: N9501A index 1)



## Power Sweep Inspector

Eqn VSWRval=5 Eqn VSWRval1=2.5

Move Marker 'loadZ' to desired impedance point.

VSWR Locus of Points selector is located on Constant Compression Loadpull page.

VSWR Locus center Impedance =  $11.00 + j8.57$   
 VSWR=5

VSWR Locus of Points selector is located on Constant Compression Loadpull page.

VSWR Locus center Impedance =  $11.00 + j8.57$   
 VSWR=5

## Summary of Performance at Compression

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$11.00 + j8.57$	$0.65 / 159.61$	0.50
Pout (dBm)	Eff (%)	GI (dB)
36.83	47.62	18.82
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-10.02	-4.17	$0.91 + j1.44$

X In plots below corresponds to this data.

## Summary of Performance at Compression

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$11.00 + j8.57$	$0.65 / 159.61$	0.50
Pout (dBm)	Eff (%)	GI (dB)
36.83	47.62	18.82
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-10.02	-4.17	$0.91 + j1.44$

X In plots below corresponds to this data.

## VSWR = 2.5 point DATA

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$11.00 + j14.29$	$0.66 / 146.70$	0.50
Pout (dBm)	Eff (%)	GI (dB)
35.84	53.66	19.49
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-12.14	-7.64	$1.36 + j2.17$

X In plots below corresponds to this data.

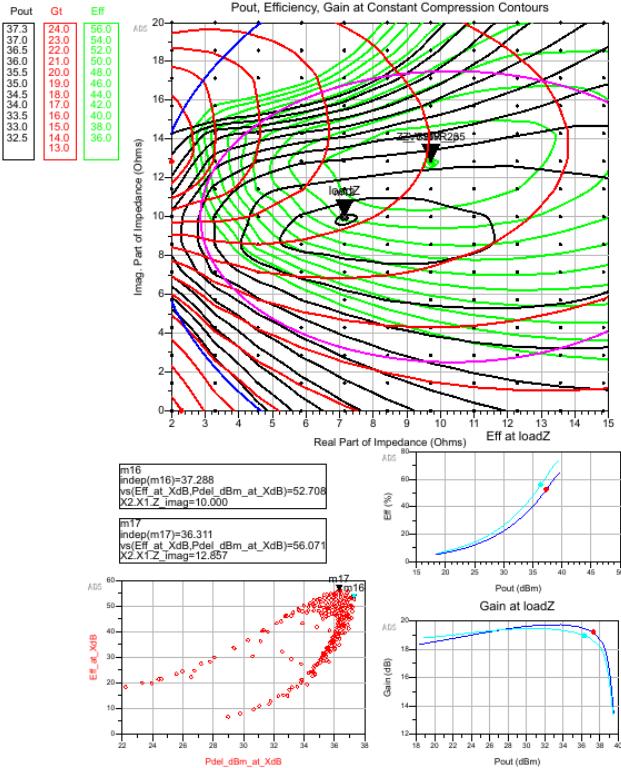
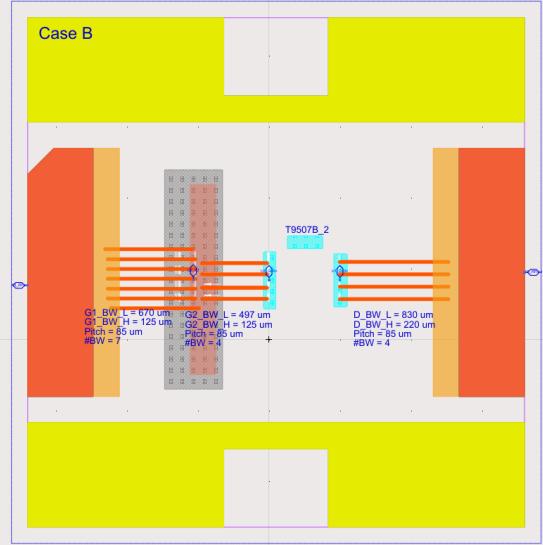
## VSWR = 3 point DATA

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$11.00 + j14.29$	$0.66 / 146.70$	0.50
Pout (dBm)	Eff (%)	GI (dB)
35.84	53.66	19.49
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-12.14	-7.64	$1.36 + j2.17$

X In plots below corresponds to this data.



# Case B : (3,53 pF: N9501B index 16)



## Power Sweep Inspector

Eqn VSWRVal=5 Eqn VSWRVal=2.5

Move Marker 'loadZ' to desired impedance point.

VSWR Locus of Points selector is located on Constant Compression Loadpull page.

VSWR Locus center Impedance =  $7.14 + j10.00$   
VSWR=5

VSWR Locus of Points selector is located on Constant Compression Loadpull page.

VSWR Locus center Impedance =  $7.14 + j10.00$   
VSWR=5

## Summary of Performance at Compression

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$7.14 + j10.00$	0.76 / 156.94	0.50
Pout (dBm)	Eff (%)	Gt (dB)
37.29	52.71	19.23
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-14.56	-2.77	$0.49 + j2.53$

X In plots below corresponds to this data.

## Summary of Performance at Compression

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$7.14 + j10.00$	0.76 / 156.94	0.50
Pout (dBm)	Eff (%)	Gt (dB)
37.29	52.71	19.23
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-14.56	-2.77	$0.49 + j2.53$

X In plots below corresponds to this data.

## VSWR = 2.5 point DATA

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$9.71 + j12.86$	0.69 / 150.15	0.50
Pout (dBm)	Eff (%)	Gt (dB)
36.31	56.07	18.96
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-15.60	-6.99	$1.16 + j2.68$

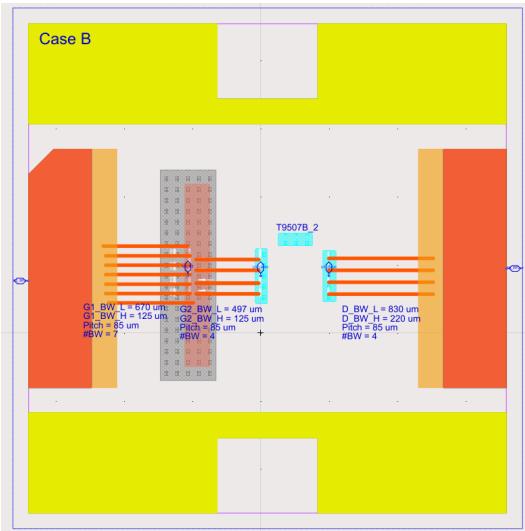
X In plots below corresponds to this data.

## VSWR = 3 point DATA

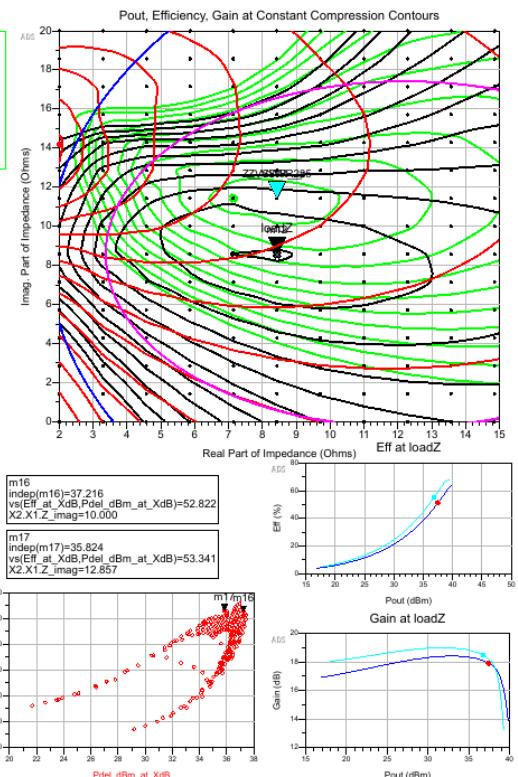
Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$9.71 + j12.86$	0.69 / 150.15	0.50
Pout (dBm)	Eff (%)	Gt (dB)
36.31	56.07	18.96
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-15.60	-6.99	$1.16 + j2.68$

X In plots below corresponds to this data.

# Case B : (4,46 pF: N9501B\_V4 index 12)



Pout	Gt	Eff
37.4	23.2	56.2
36.9	22.6	54.6
36.5	22.0	52.6
36.0	21.0	50.0
35.5	20.0	48.0
35.0	19.0	46.0
34.5	18.0	44.0
34.0	17.0	42.0
33.5	16.0	40.0
33.0	15.0	38.0
32.5	14.0	36.0
32.0	13.0	



## Power Sweep Inspector

Egn VSWRVal=5 Egn VSWRVal=2.5

Move Marker 'loadZ' to desired impedance point.

VSWR Locus of Points selector is located on Constant Compression Loadpull page.

VSWR Locus center Impedance = 8.43 + j8.57  
VSWR=5

## Summary of Performance at Compression

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
8.43 + j8.57	0.72 / 160.00	0.50
Pout (dBm)	Eff (%)	Gt (dB)
37.42	51.25	17.90
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-13.48	-3.92	0.68 + j2.55

X In plots below corresponds to this data.

VSWR Locus of Points selector is located on Constant Compression Loadpull page.

VSWR Locus center Impedance = 8.43 + j8.57  
VSWR=5

## Summary of Performance at Compression

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
8.43 + j8.57	0.72 / 160.00	0.50
Pout (dBm)	Eff (%)	Gt (dB)
37.42	51.25	17.90
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-13.48	-3.92	0.68 + j2.55

X In plots below corresponds to this data.

## VSWR = 2.5 point DATA

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
8.43 + j1.43	0.72 / 153.56	0.50
Pout (dBm)	Eff (%)	Gt (dB)
36.78	55.22	18.49
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-17.73	-5.58	0.93 + j2.85

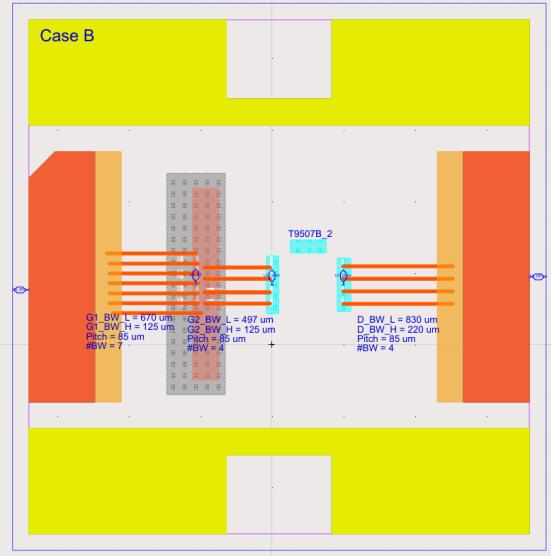
X In plots below corresponds to this data.

## VSWR = 3 point DATA

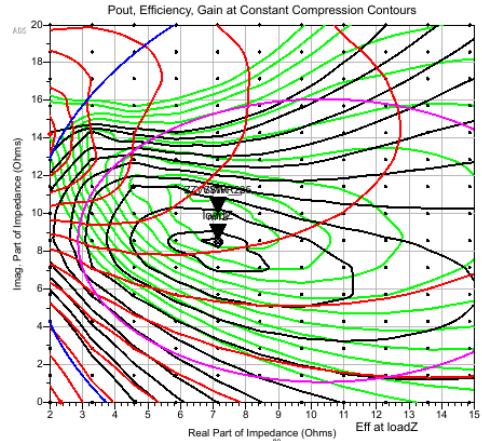
Marker Impedance	Marker Gamma	Reference Compression Level (dB)
8.43 + j1.43	0.72 / 153.56	0.50
Pout (dBm)	Eff (%)	Gt (dB)
36.78	55.22	18.49
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-17.73	-5.58	0.93 + j2.85

X In plots below corresponds to this data.

# Case B : (5,52 pF: N9501B index 10)

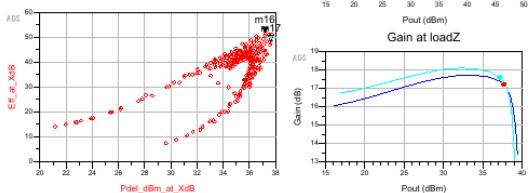


Pout	Gt	Eff
37.7	22.4	51.9
37.5	22.0	50.0
37.0	21.0	48.0
36.5	20.0	46.0
36.0	19.0	44.0
35.5	18.0	42.0
35.0	17.0	40.0
34.5	16.0	38.0
34.0	15.0	36.0
33.5	14.0	34.0
33.0	13.0	32.0



```
m16
indep(m16)=37.180
vs(Eff_at_XdB,Pdel_dBm_at_XdB)=51.913
X2.X1_Z_.imag=10.000

m17
indep(m17)=37.624
vs(Eff_at_XdB,Pdel_dBm_at_XdB)=48.640
X2.X1_Z_.imag=8.571
```



## Power Sweep Inspector

Edit VSWRVal=5 Edit VSWRVal=2.5

Move Marker loadZ to desired impedance point.

VSWR Locus of Points selector is located on Constant Compression Loadpull page.

VSWR Locus center Impedance =  $7.14 + j8.57$   
VSWR=5

## Summary of Performance at Compression

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$7.14 + j8.57$	$0.76 / 160.16$	0.50
Pout (dBm)	Eff (%)	Gt (dB)
37.69	51.21	17.21
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-15.28	-3.28	$0.56 + j2.84$

X In plots below corresponds to this data.

## VSWR = 2.5 point DATA

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$7.14 + j10.00$	$0.76 / 156.94$	0.50
Pout (dBm)	Eff (%)	Gt (dB)
37.18	51.91	17.60
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-18.87	-4.10	$0.70 + j2.97$

X In plots below corresponds to this data.

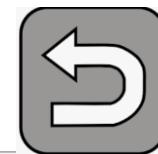
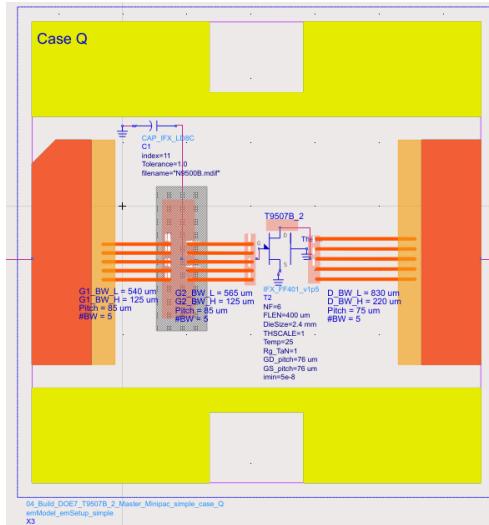
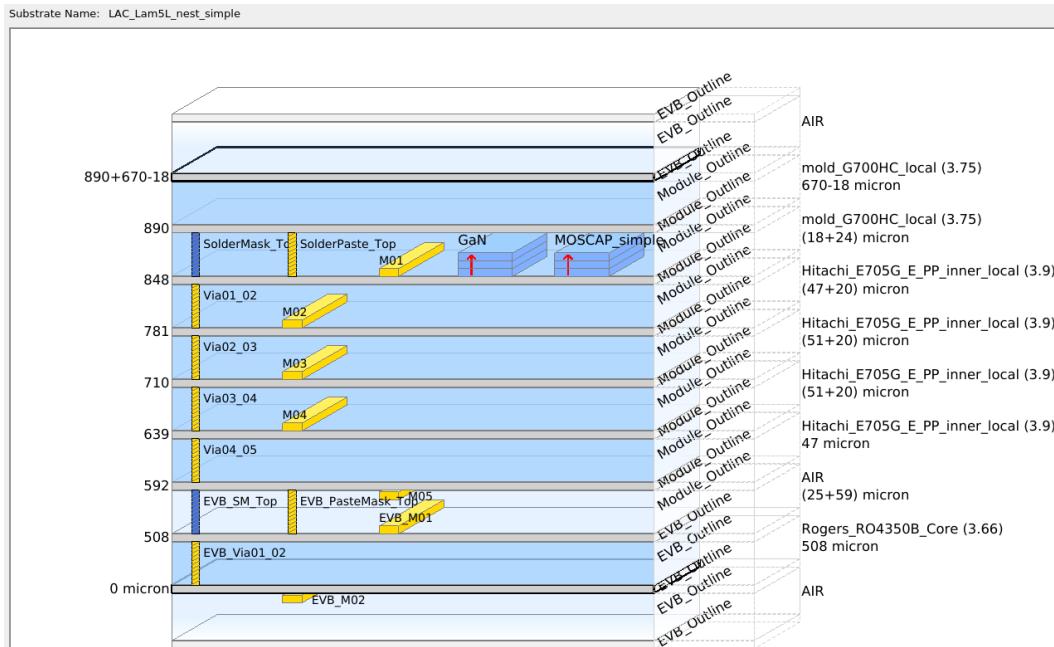
## VSWR = 3 point DATA

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$7.14 + j10.00$	$0.76 / 156.94$	0.50
Pout (dBm)	Eff (%)	Gt (dB)
37.18	51.91	17.60
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-18.87	-4.10	$0.70 + j2.97$

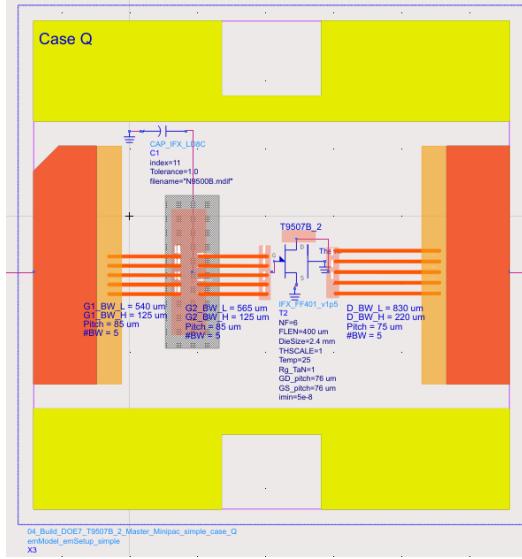
X In plots below corresponds to this data.

# LP simulations with simple EM model

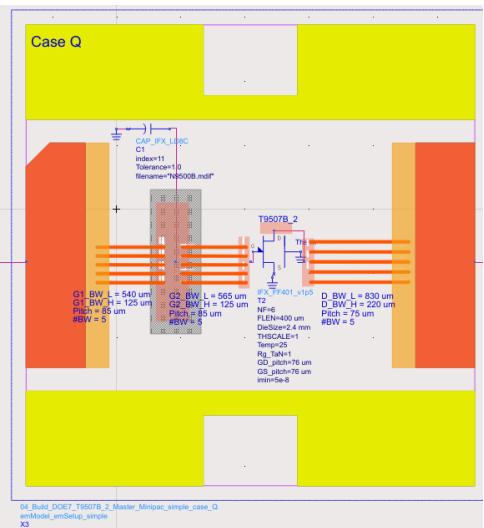
## Case Q



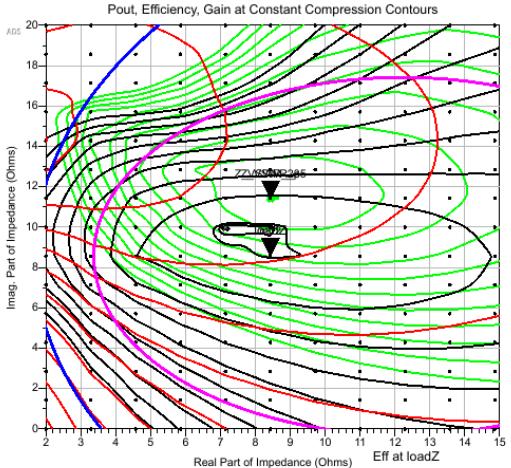
# Case Q : (4,64 pF: N9500B index 1)



# Case Q : (5,52 pF: N9500B index 11)

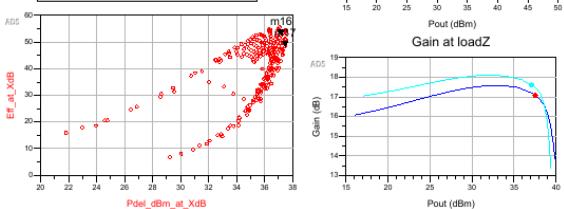


Pout	Gl	Eff
37.5	19.4	55.6
37.0	19.0	54.0
36.5	18.0	52.0
36.0	16.0	50.0
35.5	15.0	48.0
35.0	14.0	46.0
34.5	13.0	42.0
34.0	12.0	40.0
33.5	11.0	38.0
33.0	10.0	36.0



```
m16
indep(m16)=37.181
vs(Eff_at_XdB_Pdel_dBm_at_XdB)=52.692
X2.X1_Z_imag=10.000

m17
indep(m17)=37.464
vs(Eff_at_XdB_Pdel_dBm_at_XdB)=48.319
X2.X1_Z_imag=8.571
```



## Power Sweep Inspector

Egn VSWRVal=5 Egn VSWRVal=2.5

Move Marker 'loadZ' to desired impedance point.

VSWR Locus of Points selector is located on Constant Compression Loadpull page.

VSWR Locus center Impedance =  $7.14 + j10.00$   
VSWR=5

VSWR Locus of Points selector is located on Constant Compression Loadpull page.

VSWR Locus center Impedance =  $8.43 + j8.57$   
VSWR=5

## Summary of Performance at Compression

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$8.43 + j8.57$	0.72 / 160.00	0.50
Pout (dBm)	Eff (%)	Gl (dB)
37.52	50.24	17.08
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-10.83	-3.61	$0.68 + j3.93$

✗ In plots below corresponds to this data.

## Summary of Performance at Compression

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$8.43 + j8.57$	0.72 / 160.00	0.50
Pout (dBm)	Eff (%)	Gl (dB)
37.52	50.24	17.08
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-10.83	-3.61	$0.68 + j3.93$

✗ In plots below corresponds to this data.

## VSWR = 2.5 point DATA

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$8.43 + j11.43$	0.72 / 153.56	0.50
Pout (dBm)	Eff (%)	Gl (dB)
37.08	55.62	17.60
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-14.58	-4.52	$0.90 + j4.21$

✗ In plots below corresponds to this data.

## VSWR = 3 point DATA

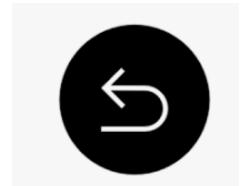
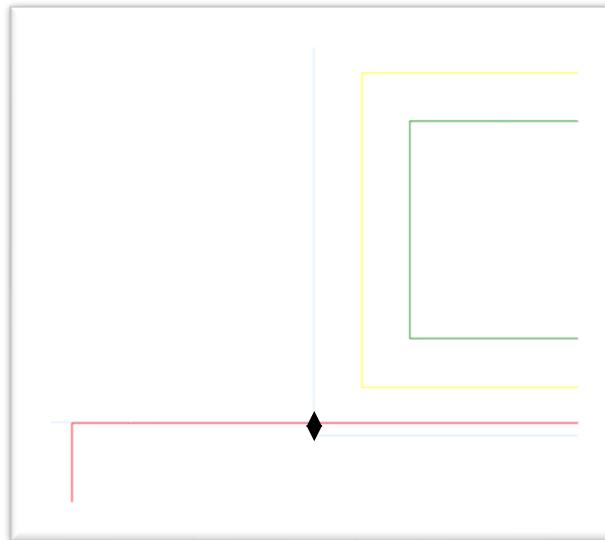
Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$8.43 + j11.43$	0.72 / 153.56	0.50
Pout (dBm)	Eff (%)	Gl (dB)
37.08	55.62	17.60
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-14.58	-4.52	$0.90 + j4.21$

✗ In plots below corresponds to this data.

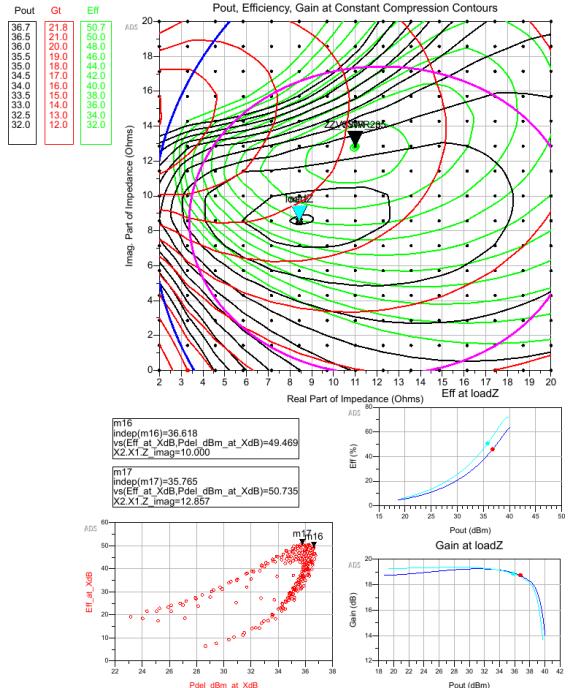
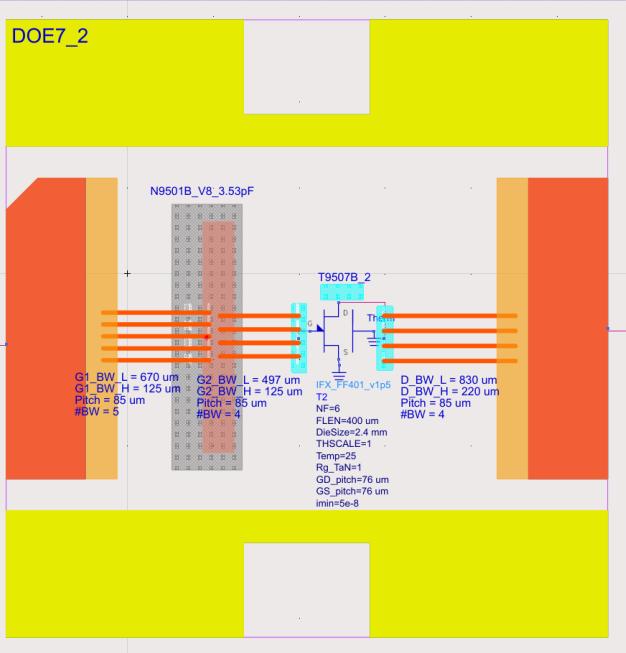




# Detailed EM simulation for Selected DOE variants with



# T9507B\_2\_N9501B\_V8\_3.53pF\_BW3g4g5g\_DOE7\_2



## Power Sweep Inspector

VSWRVal=5 VSWRVal=2.5

Move Marker 'loadZ' to desired impedance point.

VSWR Locus of Points selector is located on Constant Compression Loadpull page.

VSWR Locus center Impedance =  $8.43 + j8.57$   
VSWR=5

## Summary of Performance at Compression

Marker Impedance	$8.43 + j8.57$	Marker Gamma	$0.72 / 160.00$	Reference Compression Level (dB)	0.50
Pout (dBm)	36.74	Eff (%)	45.99	Gl (dB)	18.75
AMPM (dBm)	-6.30	IRL (dB)	-4.30	Zin (Ohm)	$0.73 + j2.75$
<b>X</b>	In plots below corresponds to this data.				

## Summary of Performance at Compression

Marker Impedance	$8.43 + j8.57$	Marker Gamma	$0.72 / 160.00$	Reference Compression Level (dB)	0.50
Pout (dBm)	36.74	Eff (%)	45.99	Gl (dB)	18.75
AMPM (dBm)	-6.30	IRL (dB)	-4.30	Zin (Ohm)	$0.73 + j2.75$
<b>X</b>	In plots below corresponds to this data.				

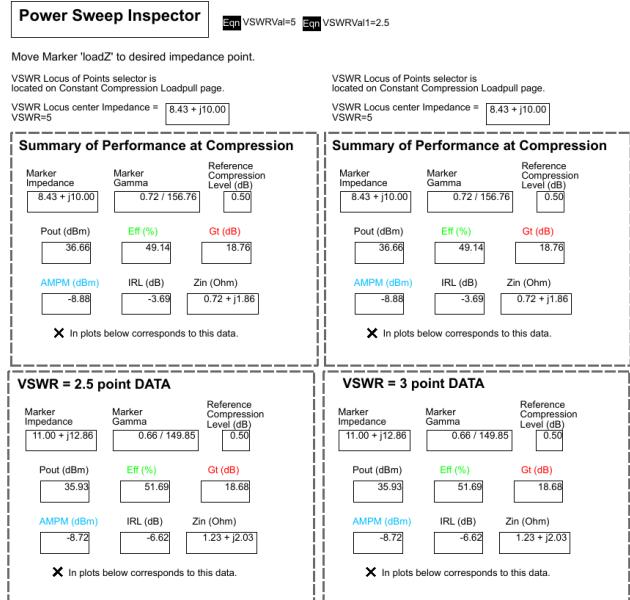
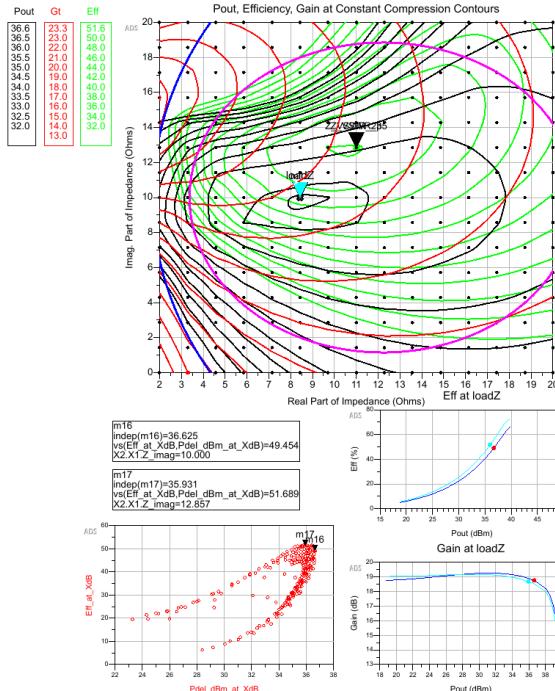
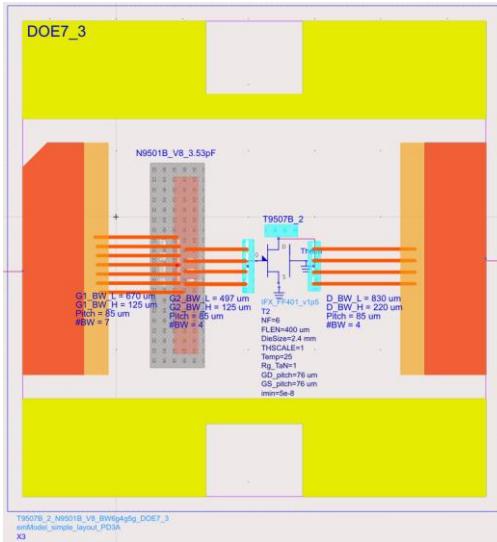
## VSWR = 2.5 point DATA

Marker Impedance	$11.00 + j12.86$	Marker Gamma	$0.66 / 149.85$	Reference Compression Level (dB)	0.50
Pout (dBm)	35.76	Eff (%)	50.74	Gl (dB)	18.87
AMPM (dBm)	-7.07	IRL (dB)	-8.11	Zin (Ohm)	$1.31 + j3.13$
<b>X</b>	In plots below corresponds to this data.				

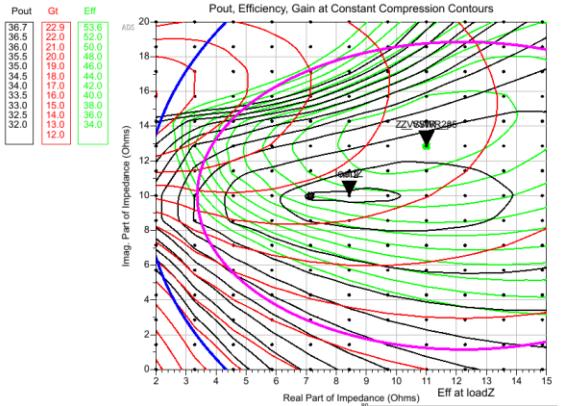
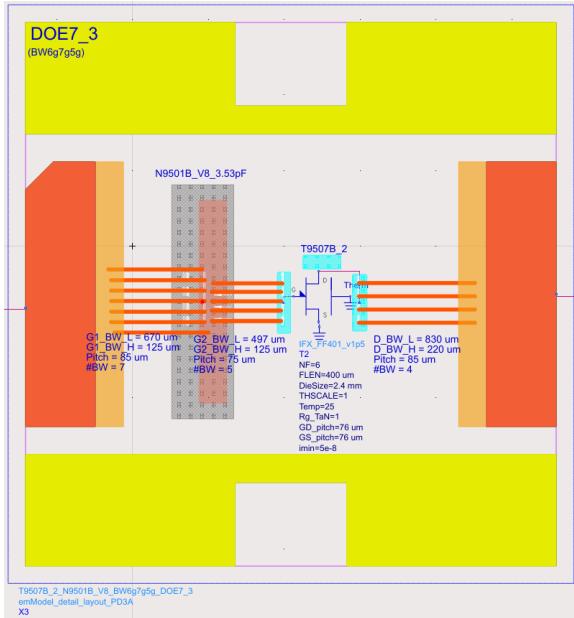
## VSWR = 3 point DATA

Marker Impedance	$11.00 + j12.86$	Marker Gamma	$0.66 / 149.85$	Reference Compression Level (dB)	0.50
Pout (dBm)	35.76	Eff (%)	50.74	Gl (dB)	18.87
AMPM (dBm)	-7.07	IRL (dB)	-8.11	Zin (Ohm)	$1.31 + j3.13$
<b>X</b>	In plots below corresponds to this data.				

# T9507B\_2\_N9501B\_V8\_3.53pF\_BW6g4g5g\_DOE7\_3



# T9507B\_2\_N9501B\_V8\_3.53pF\_BW6g7g5g\_DOE7\_3



## Power Sweep Inspector

VSWRVal=5 VSWRVal=2.5

Move Marker "loadZ" to desired impedance point.

VSWR Locus of Points selector is located on Constant Compression Loadpull page.

VSWR Locus center Impedance =  $7.14 + j10.00$   
VSWR=5

VSWR Locus of Points selector is located on Constant Compression Loadpull page.

VSWR Locus center Impedance =  $8.43 + j10.00$   
VSWR=5

## Summary of Performance at Compression

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$8.43 + j10.00$	$0.72 / 156.76$	0.50
Pout (dBm)	Eff (%)	GI (dB)
36.70	49.08	18.49
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-8.04	-3.09	$0.62 + j1.75$

x In plots below corresponds to this data.

## Summary of Performance at Compression

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$8.43 + j10.00$	$0.72 / 156.76$	0.50
Pout (dBm)	Eff (%)	GI (dB)
36.70	49.08	18.49
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-8.04	-3.09	$0.62 + j1.75$

x In plots below corresponds to this data.

## VSWR = 2.5 point DATA

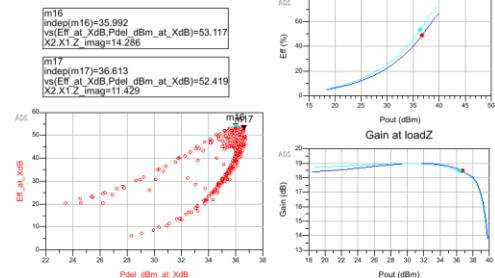
Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$11.00 + j12.86$	$0.66 / 149.85$	0.50
Pout (dBm)	Eff (%)	GI (dB)
36.35	53.61	18.47
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-7.95	-5.65	$1.08 + j1.91$

x In plots below corresponds to this data.

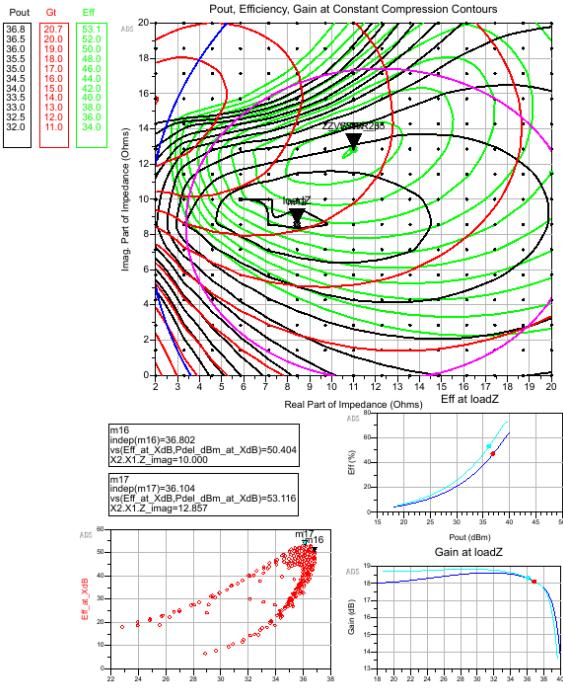
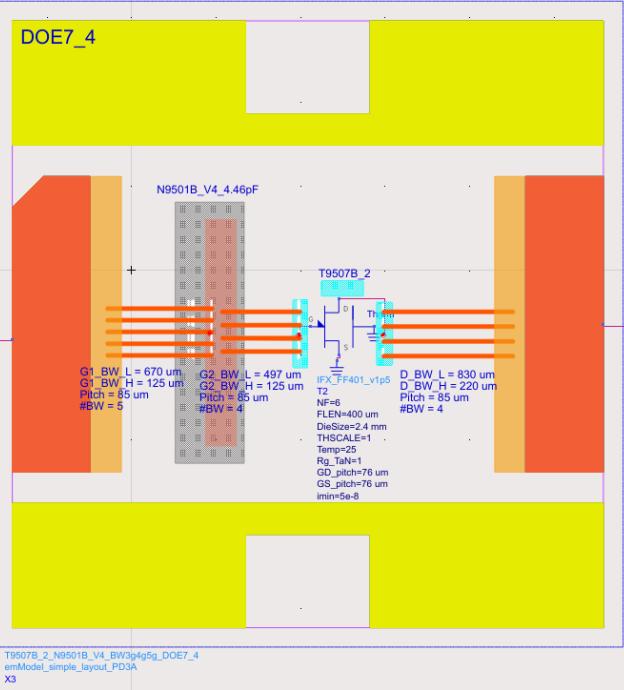
## VSWR = 3 point DATA

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$11.00 + j12.86$	$0.66 / 149.85$	0.50
Pout (dBm)	Eff (%)	GI (dB)
36.35	53.61	18.47
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-7.95	-5.65	$1.08 + j1.91$

x In plots below corresponds to this data.



# T9507B\_2\_N9501B\_V4\_4,46pF\_BW3g4g5g\_DOE7\_4



## Power Sweep Inspector

Eqn VSWRVal=5 Eqn VSWRVal=2.5

Move Marker 'loadZ' to desired impedance point.

VSWR Locus of Points selector is located on Constant Compression Loadpull page.

VSWR Locus center Impedance =  $8.43 + j8.57$

VSWR=5

## Summary of Performance at Compression

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$8.43 + j8.57$	$0.72 / 160.00$	0.50
Pout (dBm)	Eff (%)	Gt (dB)
36.85	47.08	18.11
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-6.85	-4.10	$0.70 + j3.17$

X in plots below corresponds to this data.

VSWR Locus of Points selector is located on Constant Compression Loadpull page.

VSWR Locus center Impedance =  $8.43 + j8.57$

VSWR=5

## Summary of Performance at Compression

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$8.43 + j8.57$	$0.72 / 160.00$	0.50
Pout (dBm)	Eff (%)	Gt (dB)
36.85	47.08	18.11
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-6.85	-4.10	$0.70 + j3.17$

X in plots below corresponds to this data.

## VSWR = 2.5 point DATA

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$11.00 + j12.86$	$0.86 / 149.85$	0.50
Pout (dBm)	Eff (%)	Gt (dB)
36.10	53.12	18.32
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-6.21	-7.39	$1.24 + j3.46$

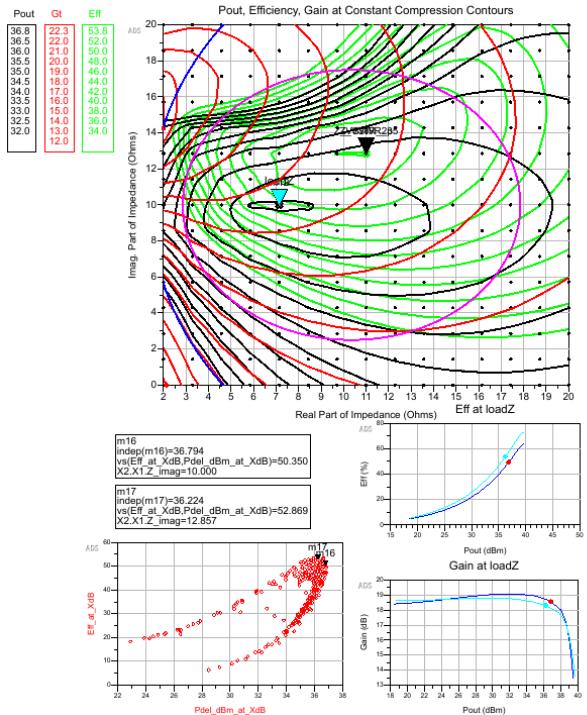
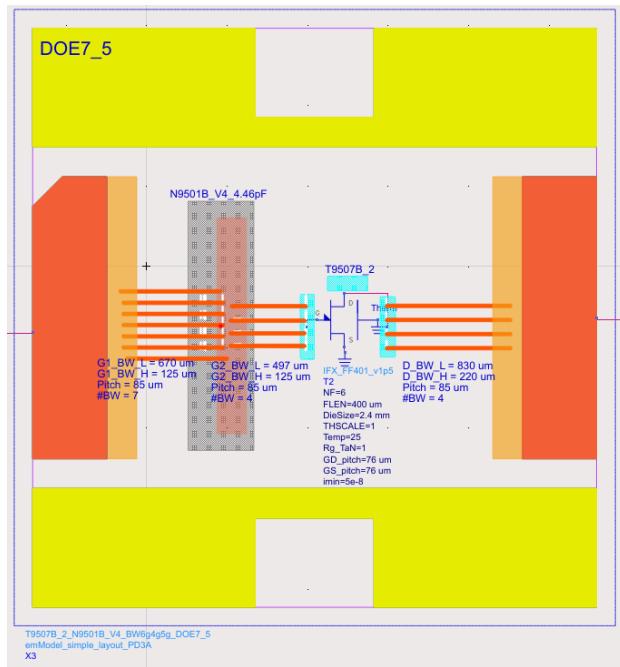
X in plots below corresponds to this data.

## VSWR = 3 point DATA

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$11.00 + j12.86$	$0.66 / 149.85$	0.50
Pout (dBm)	Eff (%)	Gt (dB)
36.10	53.12	18.32
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-6.21	-7.39	$1.24 + j3.46$

X in plots below corresponds to this data.

# T9507B\_2\_N9501B\_V4\_4,46pF\_BW6g4g5g\_DOE7\_5



## Power Sweep Inspector

Eqn VSWRVal=5 Eqn VSWRVal1=2.5

Move Marker 'loadZ' to desired impedance point.

VSWR Locus of Points selector is located on Constant Compression Loadpull page.

VSWR Locus center Impedance =  $7.14 + j10.00$

VSWR=5

VSWR Locus of Points selector is located on Constant Compression Loadpull page.

VSWR Locus center Impedance =  $7.14 + j10.00$

VSWR=5

## Summary of Performance at Compression

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$7.14 + j10.00$	$0.76 / 156.94$	0.50
Pout (dBm)	Eff (%)	Gt (dB)
36.82	49.39	18.57
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-9.92	-2.87	$0.52 + j2.28$

**X** In plots below corresponds to this data.

## VSWR = 2.5 point DATA

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$11.00 + j12.86$	$0.66 / 149.85$	0.50
Pout (dBm)	Eff (%)	Gt (dB)
36.23	53.82	18.30
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-10.03	-6.73	$1.17 + j2.34$

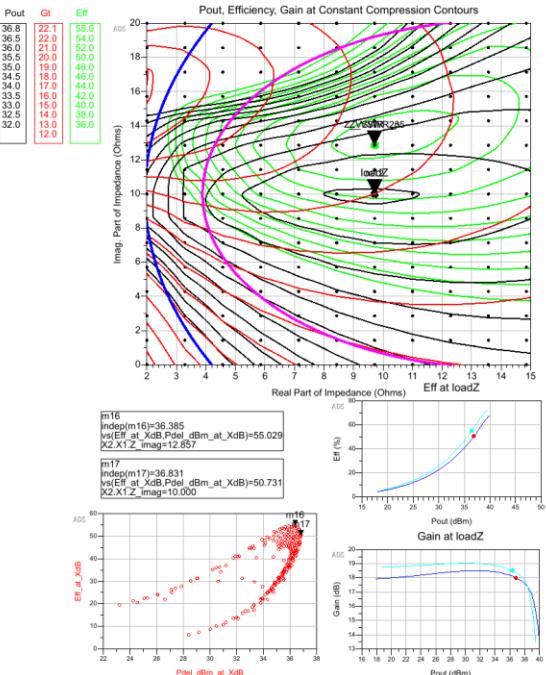
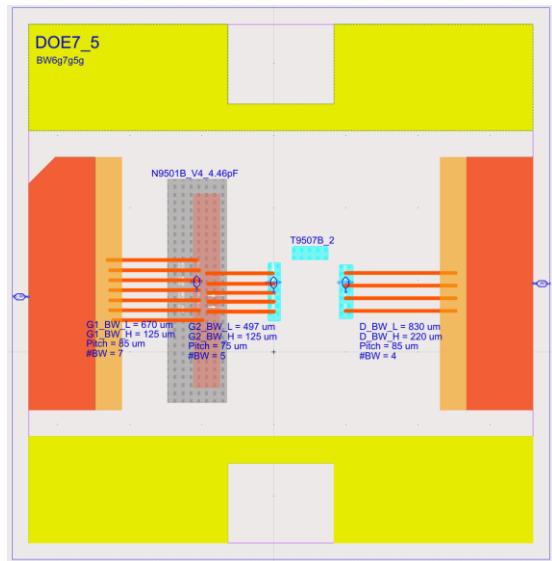
**X** In plots below corresponds to this data.

## VSWR = 3 point DATA

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$11.00 + j12.86$	$0.66 / 149.85$	0.50
Pout (dBm)	Eff (%)	Gt (dB)
36.23	53.82	18.30
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-10.03	-6.73	$1.17 + j2.34$

**X** In plots below corresponds to this data.

# T9507B\_2\_N9501B\_V4\_4,46pF\_BW6g7g5g\_DOE7\_5



## Power Sweep Inspector

VSWRVal=5 VSWRVal=2.5

Move Marker 'loadZ' to desired impedance point.

VSWR Locus of Points selector is located on Constant Compression Loadpull page.

VSWR Locus center Impedance =  $9.71 + j10.00$   
VSWR=5

## Summary of Performance at Compression

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$9.71 + j10.00$	0.69 / 156.55	0.50
Pout (dBm)	Eff (%)	Gt (dB)
36.83	50.73	18.00
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-7.82	-3.93	$0.73 + j2.09$

✖ In plots below corresponds to this data.

VSWR Locus of Points selector is located on Constant Compression Loadpull page.

VSWR Locus center Impedance =  $9.71 + j10.00$   
VSWR=5

## Summary of Performance at Compression

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$9.71 + j10.00$	0.69 / 156.55	0.50
Pout (dBm)	Eff (%)	Gt (dB)
36.83	50.73	18.00
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-7.82	-3.93	$0.73 + j2.09$

✖ In plots below corresponds to this data.

## VSWR = 2.5 point DATA

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$9.71 + j12.86$	0.69 / 150.15	0.50
Pout (dBm)	Eff (%)	Gt (dB)
36.39	55.03	18.53
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-9.40	-5.21	$0.92 + j2.36$

✖ In plots below corresponds to this data.

## VSWR = 3 point DATA

Marker Impedance	Marker Gamma	Reference Compression Level (dB)
$9.71 + j12.86$	0.69 / 150.15	0.50
Pout (dBm)	Eff (%)	Gt (dB)
36.39	55.03	18.53
AMPM (dBm)	IRL (dB)	Zin (Ohm)
-9.40	-5.21	$0.92 + j2.36$

✖ In plots below corresponds to this data.



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## Additional slides