

Figure 1 – Power Output and Efficiency vs. Power Input.

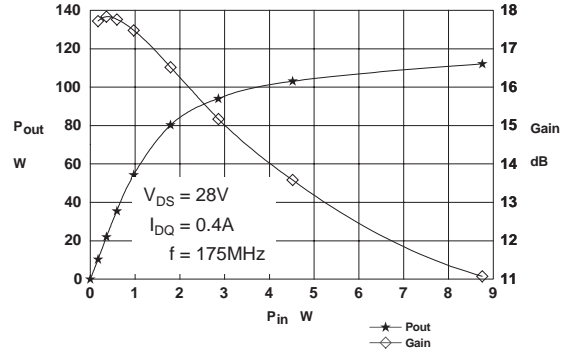


Figure 2 – Power Output & Gain vs. Power Input.

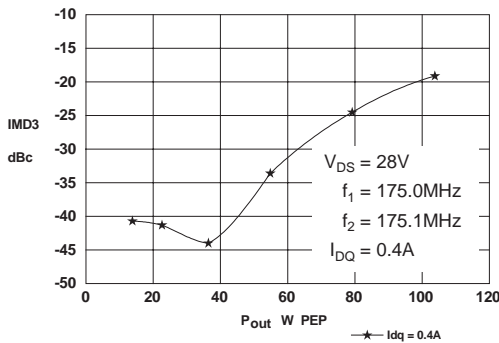


Figure 3 – IMD vs. Output Power.

**D1005
OPTIMUM SOURCE AND LOAD IMPEDANCE**

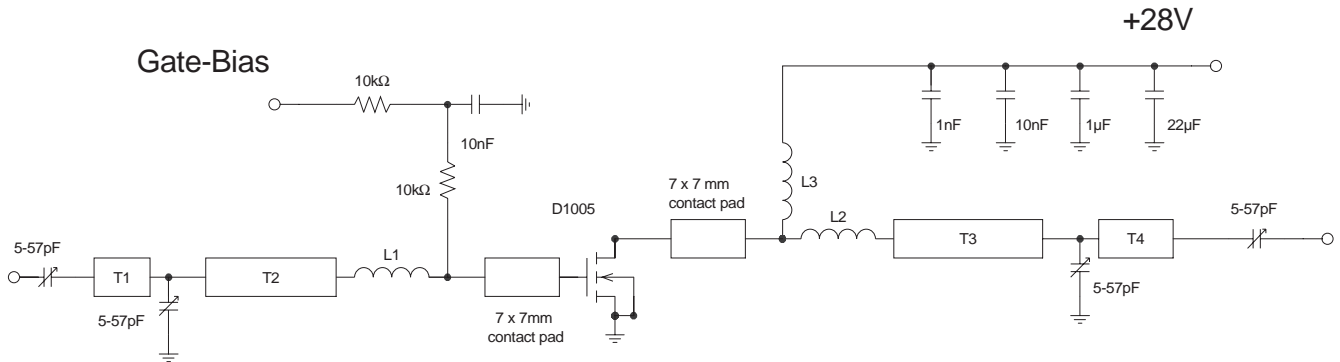
Frequency MHz	Z_S Ω	Z_L Ω
175MHz	$3 + j1$	$3 - j2.5$

Typical S Parameters

! $V_{DS} = 28V, I_{DQ} = 0.3A$

MHz S M A R 50

!Freq MHz	S11		S21		S12		S22	
	mag	ang	mag	ang	mag	ang	mag	ang
50	0.95	-58	4.29	94	0.006	34	0.66	-162
100	0.94	-79	3.32	81	0.006	57	0.75	-164
150	0.94	-104	2.26	65	0.01	98	0.84	-169
200	0.93	-124	1.59	53	0.019	107	0.88	-175
250	0.94	-140	1.2	41	0.031	103	0.92	-180
300	0.95	-152	0.94	34	0.042	102	0.93	176
350	0.96	-161	0.72	22	0.052	92	0.96	170
400	0.96	-169	0.59	19	0.064	91	0.98	164
450	0.97	-177	0.46	11	0.073	84	1.00	159
500	0.98	177	0.35	-2	0.091	82	1.00	154



D1005 175MHz TEST FIXTURE

Substrate 1.6mm PTFE/ glass, $\epsilon_r = 2.5$
All microstrip lines $W = 4.4\text{mm}$

T1 8mm
T2 22mm
T3 18mm
T4 4.5mm

L1 Hairpin loop 16swg 15.5mm dia
L2 Hairpin loop 16swg 10mm dia
L3 11 turns 18swg enamelled copper wire, 10mm i.d.

*D1005

*PSPICE MODEL FOR POINT NINE RF N-CHANNEL VERTICAL DMOS POWER FET

*May 2004

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*          _____ GATE
*          I  _____ DRAIN
*          I  I  _____ SOURCE
*          I  I  I
.SUBCKT D1005  10  20  30
*Cin1,Cin2 & Lin model the input side of the package
Cin1  10  30  0.45p
Lin   10  11  0.68n
Cin2  11  30  0.45p
LG    11  12  0.3n   ;Gate bond wire inductance
CGS   12  13  184p   ;Gate-source capacitance
MOS   14  12  13    13  D1005 L=0.9U W=0.224   ;D G S B LEVEL1
JFET  16  13  14    D1005                       ;D G S
DBODY 13  16                D1005                       ;P N
LS    13  30  0.6n   ;Source bond wire inductance
CGD   12  16  4p     ;Gate-drain feedback capacitance

*Cout1,Cout2 & Lout model the output side of the package
Cout1  16  30  1.2p
Lout   16  20  1.68n
Cout2  20  30  1.2p

.MODEL D1005  NMOS (VTO=4.76 KP=2.811E-5 LAMBDA=0.032 RD=0.019 RS=0.077)
.MODEL D1005  NJF  (VTO=-4.3 BETA=1 LAMBDA=0.54)
.MODEL D1005  D    (CJO=328.8P RS=0.25 VJ=0.7 M=0.35 BV=75)

.ENDS
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