

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

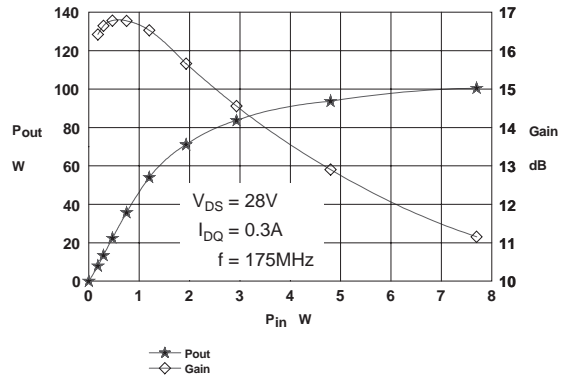


Figure 2 – Power Output & Gain vs. Power Input.

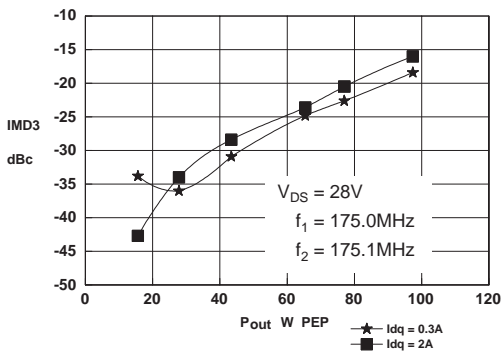


Figure 3 – IMD vs. Output Power.

**D1003
OPTIMUM SOURCE AND LOAD IMPEDANCE**

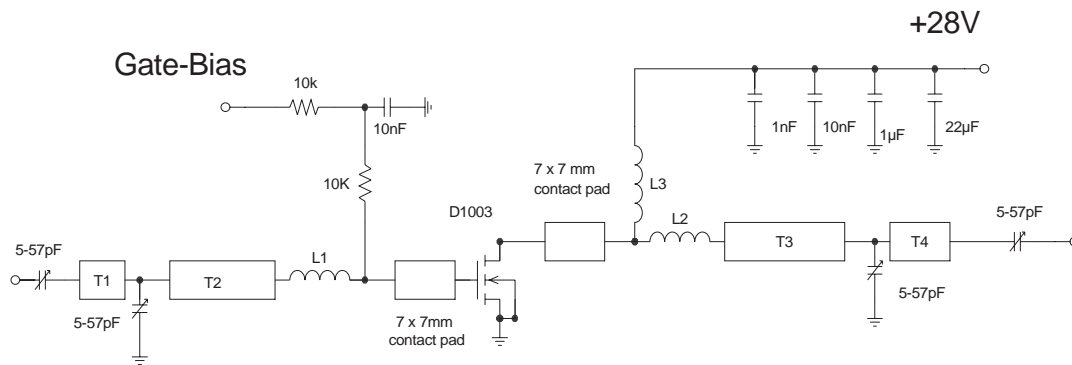
Frequency MHz	Z _S Ω	Z _L Ω
175MHz	2.0 – j4.3	3.7 – j4.5

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
70	0.83	-156.8	6.9	59.9	0.018	-16.7	0.65	-137.0
100	0.87	-163.3	4.3	46.9	0.012	-15.5	0.75	-147.2
150	0.91	-171.0	2.3	31.5	0.007	37.1	0.84	-159.7
200	0.93	-177.6	1.4	22.6	0.013	81.0	0.90	-168.8
250	0.95	177.6	0.9	14.3	0.022	86.6	0.93	-175.0
300	0.97	173.6	0.7	10.5	0.032	86.9	0.95	179.5
350	0.96	168.6	0.5	4.0	0.039	80.0	0.96	175.3
400	0.98	165.0	0.4	3.9	0.048	80.0	0.98	172.0
450	0.98	161.9	0.3	2.9	0.053	77.5	0.98	169.8
500	0.97	159.3	0.3	2.1	0.064	74.8	0.97	166.5



D1003 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.

*D1003

*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 D1003  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   1n    ;Gate bond wire inductance
CGS   12   13   138p  ;Gate-source capacitance
MOS   14   12   13    13  D1003 L=0.9U W=0.168    ;D G S B LEVEL1
JFET  16   13   14    D1003                      ;D G S
DBODY 13   16   D1003                          ;P N
LS    13   30   0.5n  ;Source bond wire inductance
CGD   12   16   3p    ;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 D1003 NMOS (VTO=4.76 KP=2.811E-5 LAMBDA=0.032 RD=0.025 RS=0.102)
.MODEL D1003 NJF  (VTO=-4.3 BETA=0.75 LAMBDA=0.54)
.MODEL D1003 D    (CJO=246.6P RS=0.25 VJ=0.7 M=0.35 BV=75)
.MODEL D1003 D    (CJO=246.6P RS=0.25 VJ=0.7 M=0.35 BV=75)

.ENDS
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