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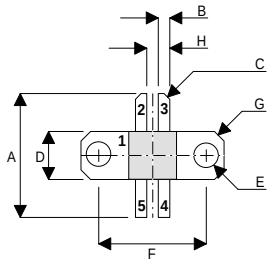
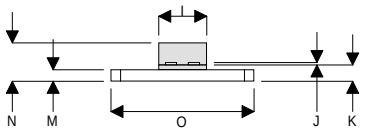
METAL GATE RF SILICON FET

MECHANICAL DATA

GOLD METALLISED MULTI-PURPOSE SILICON DMOS RF FET 5W – 28V – 1GHz PUSH–PULL





DQ

PIN 1	SOURCE (COMMON)	PIN 2	DRAIN 1
PIN 3	DRAIN 2	PIN 4	GATE 2
PIN 5	GATE 1		

DIM	mm	Tol.	Inches	Tol.
A	16.38	0.26	0.645	0.010
B	1.52	0.13	0.060	0.005
C	45°	5°	45°	5°
D	6.35	0.13	0.250	0.005
E	3.30	0.13	0.130	0.005
F	14.22	0.13	0.560	0.005
G	1.27 x 45°	0.13	0.05 x 45°	0.005
H	1.52	0.13	0.060	0.005
I	6.35	0.13	0.250	0.005
J	0.13	0.02	0.005	0.001
K	2.16	0.13	0.085	0.005
M	1.52	0.13	0.060	0.005
N	5.08	MAX	0.200	MAX
O	18.90	0.13	0.744	0.005

FEATURES

- **SIMPLIFIED AMPLIFIER DESIGN**
- **SUITABLE FOR BROAD BAND APPLICATIONS**
- **VERY LOW C_{rss}**
- **SIMPLE BIAS CIRCUITS**
- **LOW NOISE**
- **HIGH GAIN – 13 dB MINIMUM**

APPLICATIONS

- VHF/UHF COMMUNICATIONS from 50 MHz to 1 GHz

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C unless otherwise stated)

P_D	Power Dissipation	35W
BV_{DSS}	Drain – Source Breakdown Voltage *	65V
BV_{GSS}	Gate – Source Breakdown Voltage *	±20V
$I_{D(sat)}$	Drain Current *	1A
T_{stg}	Storage Temperature	–65 to 150°C
T_j	Maximum Operating Junction Temperature	200°C

* Per Side

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ELECTRICAL CHARACTERISTICS (T_{case} = 25°C unless otherwise stated)

Parameter		Test Conditions		Min.	Typ.	Max.	Unit
PER SIDE							
BV_{DSS}	Drain–Source Breakdown Voltage	V_{GS} = 0	I_D = 10mA	65			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 28V	V_{GS} = 0			1	mA
I_{GSS}	Gate Leakage Current	V_{GS} = 20V	V_{DS} = 0			1	μA
$V_{GS(th)}$	Gate Threshold Voltage*	I_D = 10mA	V_{DS} = V_{GS}	1		7	V
g_{fs}	Forward Transconductance*	V_{DS} = 10V	I_D = 1A	0.18			S
TOTAL DEVICE							
G_{PS}	Common Source Power Gain	P_O = 5W		13			dB
η	Drain Efficiency	V_{DS} = 28V	I_{DQ} = 0.2A	40			%
VSWR	Load Mismatch Tolerance	f = 1GHz		20:1			—
PER SIDE							
C_{iss}	Input Capacitance	V_{DS} = 28V	V_{GS} = –5V f = 1MHz			12	pF
C_{oss}	Output Capacitance	V_{DS} = 28V	V_{GS} = 0 f = 1MHz			6	pF
C_{rss}	Reverse Transfer Capacitance	V_{DS} = 28V	V_{GS} = 0 f = 1MHz			0.5	pF

* Pulse Test: Pulse Duration = 300 μs , Duty Cycle ≤ 2%

HAZARDOUS MATERIAL WARNING

The ceramic portion of the device between leads and metal flange is beryllium oxide. Beryllium oxide dust is highly toxic and care must be taken during handling and mounting to avoid damage to this area.

THESE DEVICES MUST NEVER BE THROWN AWAY WITH GENERAL INDUSTRIAL OR DOMESTIC WASTE.

THERMAL DATA

$R_{THj–case}$	Thermal Resistance Junction – Case	Max. 5.0°C / W

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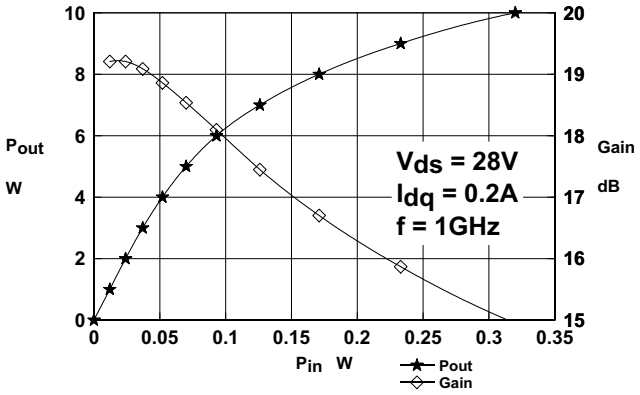

Figure 1 Output Power and Gain vs. Input power

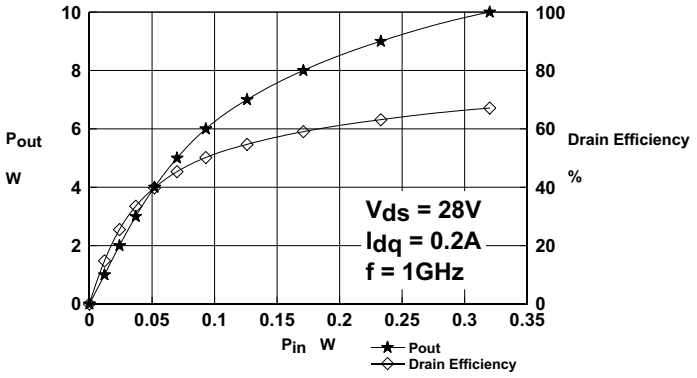

Figure 2 Output Power and Efficiency vs. Input Power

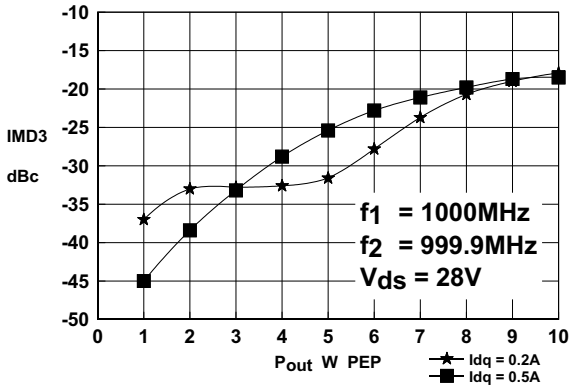

Figure 3 IMD Vs. Output Power.

OPTIMUM SOURCE AND LOAD IMPEDANCE

Frequency MHz	Z_S Ω	Z_L Ω
1000MHZ	1.1 - j2.5	5.1 - j17.1

Typical S Parameters

! Vds=28V, Idq=0.1A
MHZ S MA R 50

!Freq !MHz	S11 mag	S11 ang	S21 mag	S21 ang	S12 mag	S12 ang	S22 mag	S22 ang
70	0.97	-36.4	15.8	156.6	0.017	67.2	0.91	-23.2
100	0.94	-48.0	14.1	146.3	0.021	58.1	0.88	-30.1
150	0.88	-65.3	12.3	129.9	0.027	45.5	0.81	-40.3
200	0.84	-78.5	10.2	114.7	0.029	34.8	0.77	-48.1
250	0.82	-88.4	8.8	106.0	0.029	28.1	0.75	-54.2
300	0.79	-97.1	7.7	98.3	0.029	27.3	0.73	-59.1
350	0.78	-105.5	6.9	88.5	0.028	22.2	0.72	-64.3
400	0.77	-113.3	6.0	84.5	0.026	24.2	0.71	-69.3
450	0.77	-121.8	5.4	77.8	0.024	23.3	0.70	-75.2
500	0.77	-128.9	4.9	75.3	0.022	29.6	0.70	-80.4
550	0.78	-136.7	4.6	68.3	0.020	35.0	0.70	-86.5
600	0.78	-144.0	4.4	65.4	0.020	46.6	0.70	-93.6
650	0.78	-150.8	4.0	57.2	0.020	57.6	0.70	-99.6
700	0.79	-156.7	3.7	52.3	0.022	68.5	0.71	-105.8
750	0.79	-160.9	3.4	46.7	0.025	76.6	0.70	-111.3
800	0.78	-164.2	3.0	41.4	0.028	81.6	0.69	-115.6
850	0.78	-166.3	2.7	39.5	0.032	87.8	0.68	-117.0
900	0.79	-168.5	2.6	38.4	0.036	92.3	0.68	-119.3
950	0.78	-170.3	2.5	36.8	0.044	97.4	0.70	-121.0
1000	0.79	-172.5	2.4	33.0	0.053	97.4	0.70	-124.2

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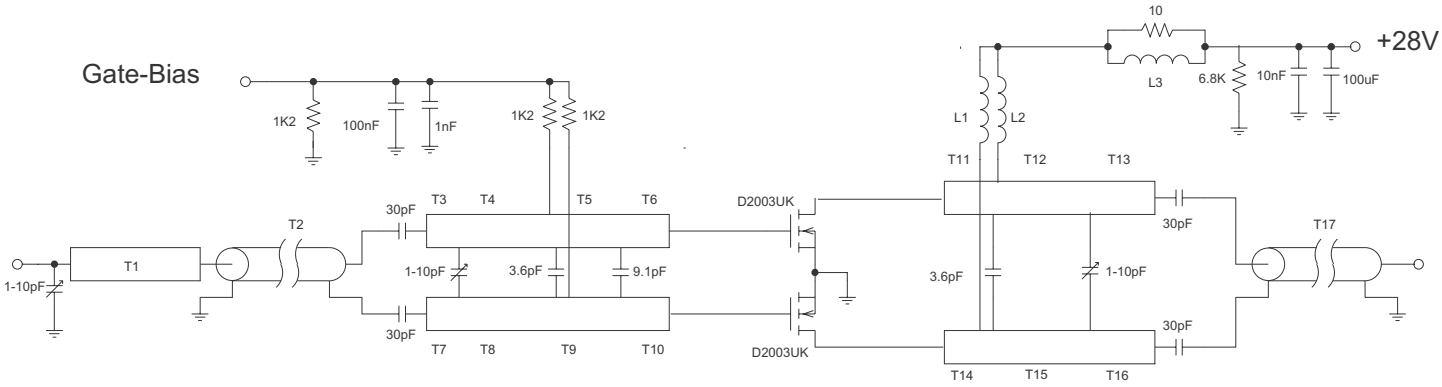

1000MHz TEST FIXTURE

Substrate 0.8mm thick PTFE/glass
All microstrip lines W = 2.7mm

T1	15.7
T2, T17	45mm 50 OHM UT 34 semi-rigid coax
T3, T7	7mm
T4, T8	15mm
T5, T9	7.6mm
T6, T10	8mm
T11,T14	8mm
T12,T15	11.2mm
T13,T16	7mm

L1, L2	6 turns 24swg enamelled copper wire, 3mm i.d.
L3	1.5 turn 24swg enamelled copper wire on Siemens B62152-A7X 2 hole core