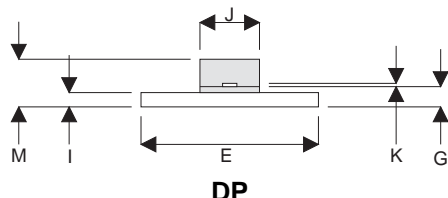
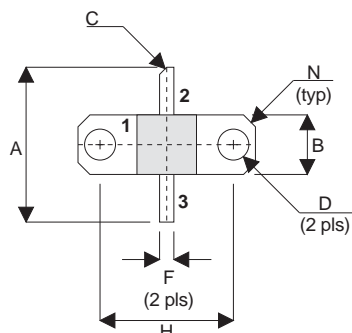


## MECHANICAL DATA

# GOLD METALLISED MULTI-PURPOSE SILICON DMOS RF FET 2.5W – 28V – 1GHz SINGLE ENDED



PIN 1 SOURCE PIN 2 DRAIN  
PIN 3 GATE

DIM	mm	Tol.	Inches	Tol.
A	16.51	0.25	0.650	0.010
B	6.35	0.13	0.250	0.005
C	45°	5°	45°	5°
D	3.30	0.13	0.130	0.005
E	18.92	0.08	0.745	0.003
F	1.52	0.13	0.060	0.005
G	2.16	0.13	0.085	0.005
H	14.22	0.08	0.560	0.003
I	1.52	0.13	0.060	0.005
J	6.35	0.13	0.250	0.005
K	0.13	0.03	0.005	0.001
M	5.08	0.51	0.200	0.020
N	1.27 x 45°	0.13	0.050 x 45°	0.005

## FEATURES

- SIMPLIFIED AMPLIFIER DESIGN
- SUITABLE FOR BROAD BAND APPLICATIONS
- 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 ( $T_{case} = 25^{\circ}C$  unless otherwise stated)

$P_D$	Power Dissipation	17.5W
$BV_{DSS}$	Drain – Source Breakdown Voltage	65V
$BV_{GSS}$	Gate – Source Breakdown Voltage	$\pm 20V$
$I_{D(sat)}$	Drain Current	1A
$T_{stg}$	Storage Temperature	$-65$ to $150^{\circ}C$
$T_j$	Maximum Operating Junction Temperature	$200^{\circ}C$

Semelab Plc reserves the right to change test conditions, parameter limits and package dimensions without notice. Information furnished by Semelab is believed to be both accurate and reliable at the time of going to press. However Semelab assumes no responsibility for any errors or omissions discovered in its use. Semelab encourages customers to verify that datasheets are current before placing orders.

## ELECTRICAL CHARACTERISTICS ( $T_{case} = 25^{\circ}C$ unless otherwise stated)

Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$BV_{DSS}$ 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	$\mu A$
$V_{GS(th)}$ Gate Threshold Voltage*	$I_D = 10mA$ $V_{DS} = V_{GS}$	1		7	V
$g_{fs}$ Forward Transconductance*	$V_{DS} = 10V$ $I_D = 0.2A$	0.18			S
$G_{PS}$ Common Source Power Gain	$P_O = 2.5W$	13			dB
$\eta$ Drain Efficiency	$V_{DS} = 28V$ $I_{DQ} = 0.1A$	40			%
VSWR Load Mismatch Tolerance	$f = 1GHz$	20:1			—
$C_{iss}$ 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  $\mu s$  , Duty Cycle  $\leq 2\%$

## HAZARDOUS MATERIAL WARNING

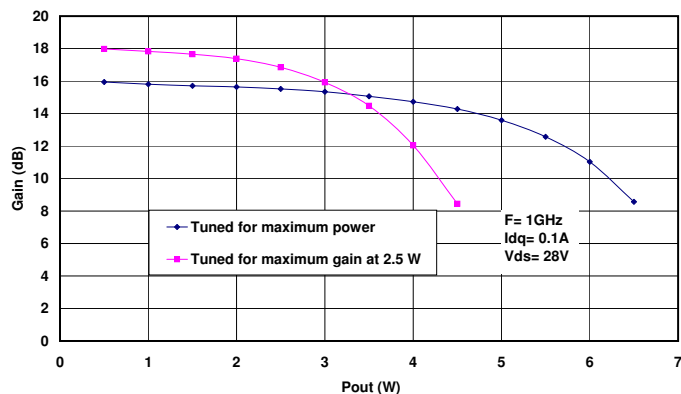
The ceramic portion of the device between leads and metal flange is beryllium oxide. Beryllium oxide dust is highly toxic and care must be taken during handling and mounting to avoid damage to this area.

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

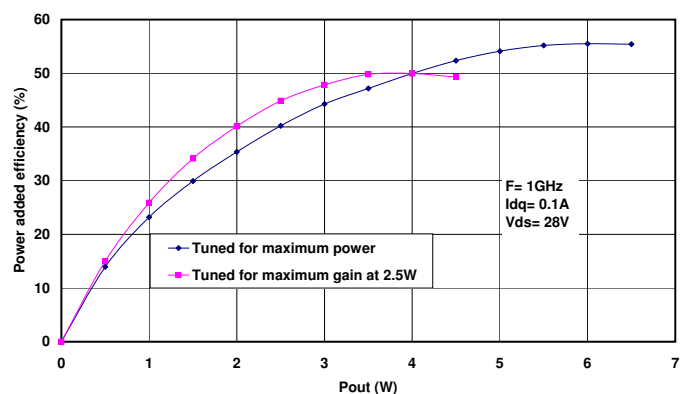
## THERMAL DATA

$R_{THj-case}$	Thermal Resistance Junction – Case	Max. 10 $^{\circ}C$ / W
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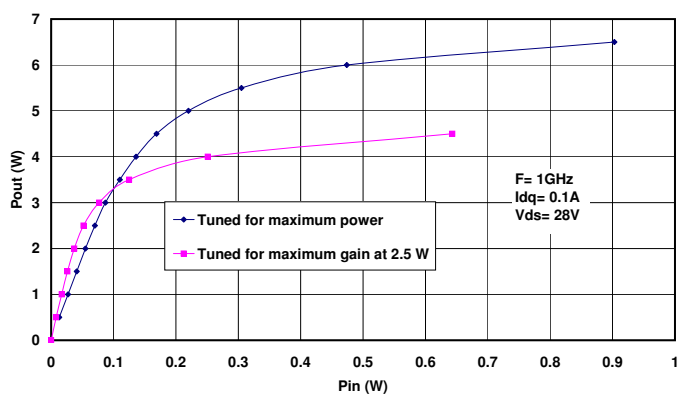
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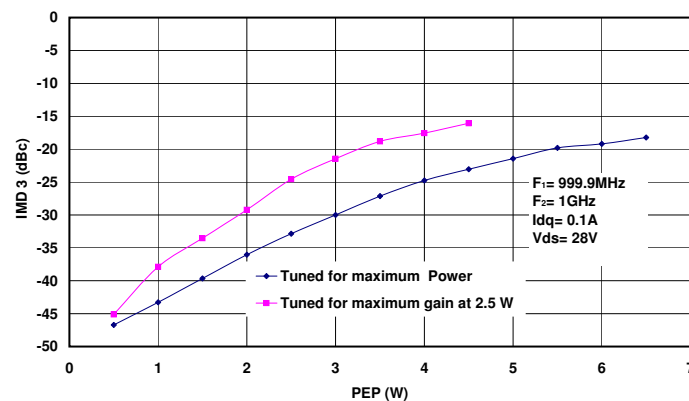
**Figure 1**  
Gain vs. Output Power.



**Figure 2**  
Power added efficiency vs. Output Power.



**Figure 3**  
Output Power vs. Input Power.



**Figure 4**  
IMD 3 vs. PEP

## Typical S Parameters

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

!Freq !MHz	S11 mag	ang	S21 mag	ang	S12 mag	ang	S22 mag	ang
100	0.966	-47	16.778	144	0.01479	56	0.923	-28
200	0.891	-81	12.882	118	0.02114	34	0.841	-48
300	0.841	-103	9.772	99	0.02213	20	0.794	-62
400	0.804	-120	7.674	84	0.01995	11	0.759	-73
500	0.804	-134	6.237	69	0.01641	6	0.75	-86
600	0.804	-143	4.955	59	0.01175	9	0.767	-97
700	0.822	-147	4.121	54	0.00906	41	0.776	-101
800	0.822	-154	3.631	45	0.01109	73	0.813	-107
900	0.841	-162	3.162	36	0.01718	88	0.813	-116
1000	0.832	-168	2.6	30	0.02344	94	0.804	-122

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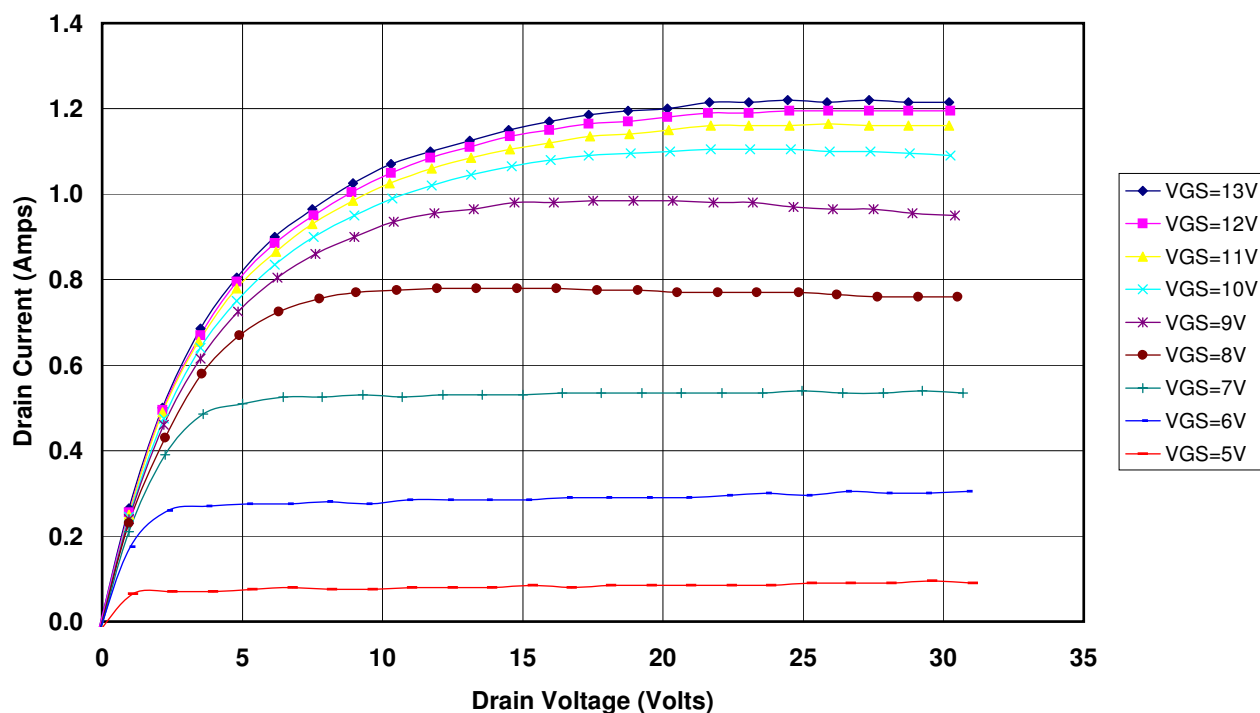


Figure 5 – Typical IV Characteristics.

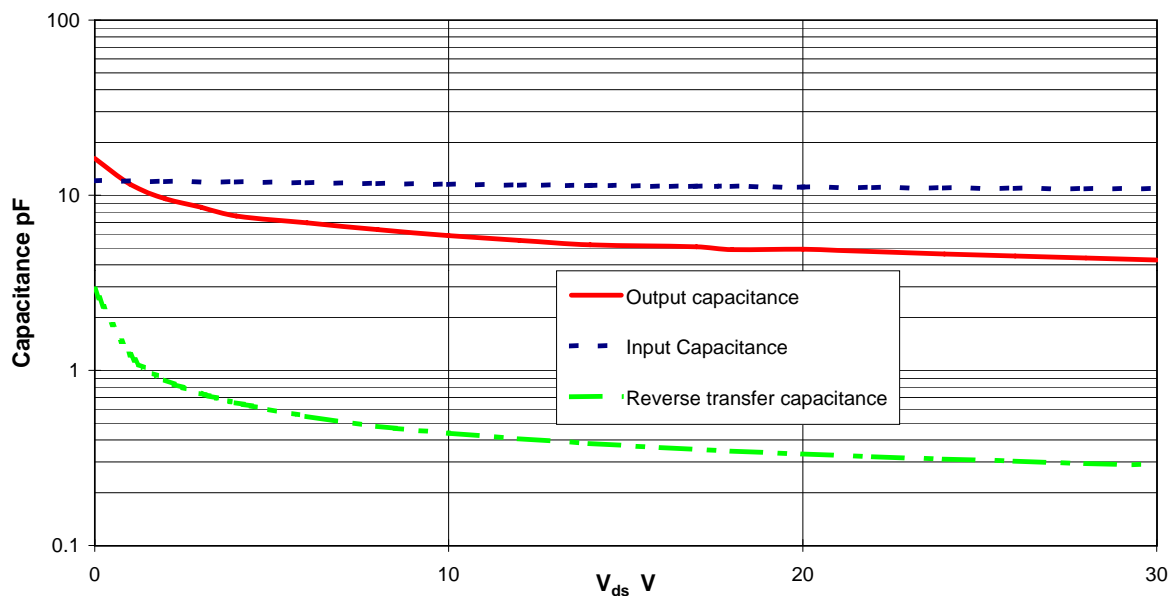
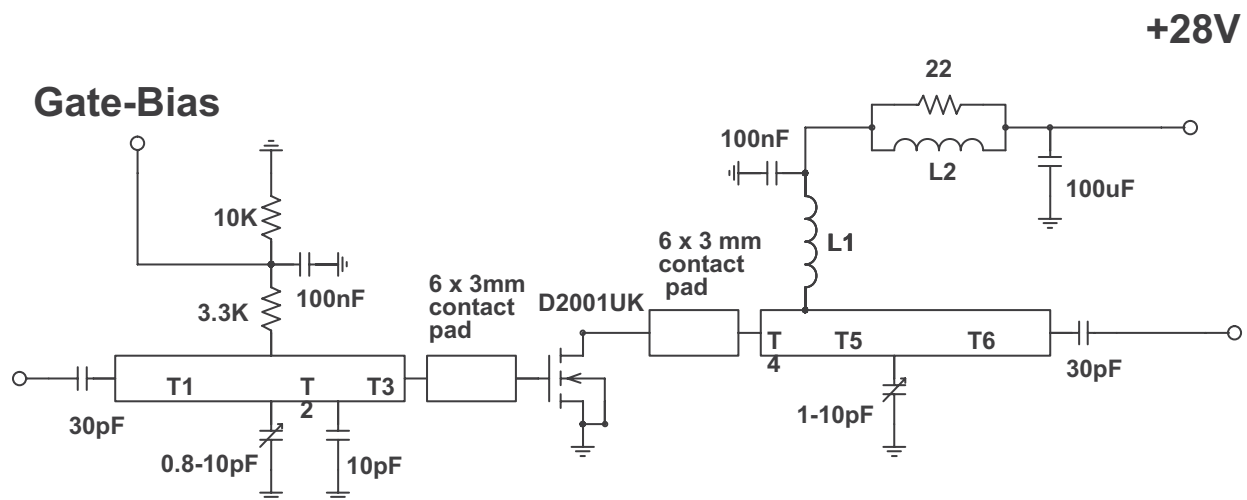


Figure 6 – Typical CV Characteristics.

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## D2001UK 1GHz TEST FIXTURE

Substrate 0.8mm PTFE/glass,  $\epsilon_r = 2.5$   
All microstrip lines  $W = 2.4\text{mm}$

T1	35 mm
T2, T5	15 mm
T3	3 mm
T4	4 mm
T6	32 mm

L1	7 turns 24swg enamelled copper wire, 3mm i.d.
L2	1.5 turns 24swg enamelled copper wire on ferrite core